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Junior FORT DODGE BIO-CHEMIC REVIEW

SEPTEMBER 1935

NATIONAL DOG WEEK

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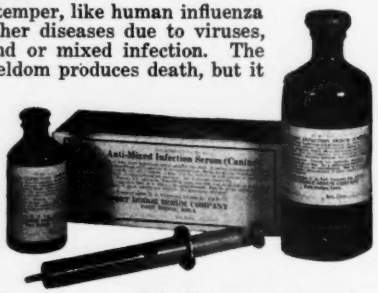

• Canine distemper, like human influenza and many other diseases due to viruses, is a compound or mixed infection. The virus itself seldom produces death, but it sets the stage for fatal complications due to mass invasion of secondary infections. Practically all cases of canine distemper as brought to veterinarians are suffering from purulent opthalmia, enteritis, pneumonia, bronchitis or meningitis.

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BABY HIPPO—45-pound offspring of member of Brookfield (Ill.) zoo takes first walk. © Keystone.

Veterinary Medicine

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor
H. J. Mostyn, R.K.O. Bldg., New York, Eastern Representative

DOCTOR DORSET

Dr. Marion Dorset, Chief of the Biochemic Division of the Bureau of Animal Industry, United States Department of Agriculture since 1904, died at his home in Washington, D. C., July 14, 1935, aged 63 years. During the 41 years that he was connected with the B. A. I., Doctor Dorset achieved much for the live stock industry and for the public welfare. Determining that hog cholera is due to a filterable virus and the development of a successful anti-serum brought him imperishable renown. The enormous production of tuberculin of the highest dependability which has contributed greatly to the success of the bovine tuberculosis eradication project, and the recent development of a synthetic, protein-free liquid medium for use in the production of tuberculin that promises an even more precise, diagnostic agent for that work are two of his contributions to that most important of animal disease control projects. For nearly a year after this country entered the World War the millions of doses of mallein used by the army were produced under Doctor Dorset's supervision. There was nowhere else to procure mallein in considerable quantities at the time and it was imperatively needed. Other scientific achievements less spectacular were numerous.

Doctor Dorset's contributions to scientific veterinary literature were many and important. Many programs of the A. V. M. A. and of the United States Live Stock Sanitary Association were enriched by papers from his pen as were also the programs of the eleventh (1930) and the twelfth (1934) International Veterinary Congresses. The nation is more prosperous, happier and healthier for his having lived.

* * * *

Dr. W. M. Stanley of the Rockefeller Institute for Medical Research, reports the isolation of a crystalline protein from diseased tobacco leaves, which produces tobacco mosaic in healthy plants. The self-propagating crystals of mosaic virus, according to Doctor Stanley, are not alive but may be regarded as an auto-catalytic protein. Tobacco mosaic has long been regarded as a typical virus disease and finding that its cause is not a living organism naturally raises the question as to whether any of the virus diseases are due to living organisms—as to whether measles, small pox or poliomyelitis and in animals, hog cholera, encephalomyelitis, range paralysis, etc., are due to living organisms. Of course, that the latter disease is due to a living organism has already been questioned.

"The Rabies Racket"

INASMUCH as the domestic dog is universally held responsible for the incidence of rabies, it seems stupid in those promoting the popularity of this useful animal to oppose the eradication of rabies. The old subterfuge that no such a disease exists has lost momentum. Facts of medicine cannot be covered up forever. Intelligent people now question the knowledge or the sincerity of editors of the dog press who know so little about so salient a problem of dog life as to question the occurrence of rabies, pooh-pooh its prevalence or belittle its importance. Willful misrepresentation is not charged. Like the dairyman with his tuberculous cow, the dog industry does not like to be convinced that his exploitation is a menace to mankind. Only overwhelming evidence could have closed the ridiculous anti-scientific controversy over the existence of rabies.

NOW, leaders in the dog industry take another tack. They join forces with the sentimental anti-vaccinationists and opponents of animal experimentation by fighting rabies vaccination. The scientific facts about tuberculosis which led to increased confidence in the wholesomeness of milk and increased its consumption enormously, were hard to impress upon the dairymen. It seems as hard to impress the "doggy" crowd with the importance of removing the principal anxiety over keeping a dog in the family circle. If there is anything in sight that would more completely remove the fear of rabies in the family dog than cultivating confidence in rabies vaccination we do not know where to look for it, nor is there anything in sight that is more promising for the eradication of rabies than single dose vaccination used in conjunction with other well known, well tried, common sense measures.

The hackneyed insinuation that veterinarians advocate rabies vaccination for selfish purposes is as old as it is rotten and as nauseating as ipecac. The dog world must find something new and more original. The dairyman began wearing that one threadbare forty-five years ago when tuberculin came into the veterinary horizon. The obligation of medicine is to extol to the public all facts as they come to light. If the medical or veterinary profession "get jobs" as a consequence, the luck is not theirs. Strange, how medicine is charged with trying to make jobs for itself when it institutes campaigns to eliminate the thing from which it lives.

RABIES is a veterinary problem. It is ours to solve. The medical profession is reminding us of this from all sides in order that the few cases of rabies that occur in man may be eliminated. But, the veterinary profession is obligated to remind dog owners that there are other domestic animals to protect besides the family dog of the town population, animals to which people look for food, wealth, power and sport. Dogdom cannot overrule the live stock industry with its sentimentalism. When farmers think of eradicating rabies they also think of eradicating dogs, that the losses dogs cause may be stopped. The farmer who has a flock of sheep mutilated by dogs or loses a dozen cows from a rabid dog running amuck in the pasture is not apt to work up much sentiment in favor of dogs and dog lovers. It is short-sighted of dogdom not to cooperate with the breeders of other species of domestic animals. When the veterinary service conducts a crusade against a disease it resorts to all helpful measures to accomplish the purpose. Keeping dogs in their proper domicile, getting rid of strays and vaccination is a trinity of measures in rabies control that cannot be discredited for long in this country where the incidence of the disease is mounting higher each year. Dodging a sensible program for rabies control is but to keep dogs out of the big picture of animal production. Shifting common sense aside in animal disease control is about as easy in the long run as dodging raindrops in a thunder shower. The sensible thing for the dog industry to do is to demand, unitedly, that live stock sanitary and public health authorities take up at once the eradication of this unnecessary disease of animals and man.

DOG breeding is a new industry in the United States. It still lacks experience. It is still unaware of the potentialities of veterinary medicine. It can call veterinarians names like the cowman did but it cannot stop veterinary medicine, because it is sound and indispensable to the success of any live stock industry. Calling rabies control a racket is a pretty raw deal from sentimental dogdom in view of the sad scenes rabies paints in the bedroom and in the barnyard, the agony it inflicts on man and animals, not to mention the toll it takes in money. The dog breeding industry flourishes in the British Isles. There it saw the wisdom of abolishing rabies at any cost. As long as rabies exists to the present extent in this country, dogdom can go only from the ridiculous to the detestable. In its relations to dogs the American population is divided into three groups: The devoted, the indifferent, and the hater. Better that the dog industry take an inventory of these than to throw nasty dirt at conscientious efforts to prevent suffering.

For its own prosperity it had better take a leaf from the experience in countries where it has made greater progress than here. In the British Isles no one is deterred from keeping a dog because of the fear of rabies. The same is true of the Scandinavian countries, of Australia, measurably true of Canada and approaching realization in Germany, although that nation was overrun with rabies at the close of the World War. In this country millions are reluctant to introduce a dog into the family circle because of a fear of rabies. None know this so well as veterinarians. Veterinarians advocate the eradication of rabies because it would save a human life occasionally and a vast amount of anxiety and suffering and because of the loss and suffering in animals it would prevent. The fees they would earn in eradicating the disease are inconsequential to them in comparison with the advantages accruing from the greatly increased number of dogs that would be kept in the homes of America were the fear of rabies eliminated. A dog industry that could see beyond the end of its nose would recognize this.

Stupid Leadership

A judge would not likely fine his daughter for fast driving, nor a farmer arrest his wife for selling dirty cream.

Though considerable progress has been made in improving the milk supply of the larger cities through the demands of health officials, cream production remains an abomination. Cream skimmed from the fourteen milkings of a week is still thrown into a can down in the cellar to be picked up by the cream man in his weekly rounds and mixed pell mell with other cream of the same general sort, whereupon it is trucked off, regardless of temperature, to the creamery miles away. Here, it is "processed" for the consumer as cream or made into butter. In a general way this characterizes much of the cream production at the moment.

Federal inspectors not long ago visited Cincinnati, condemning hundreds of cans of cream involved in interstate shipment because it contained "extraneous material," which to the connoisseur of milk production means cow dung. *The Country Gentleman* writing editorially on the cream situation, says: "It appears that the careless cream producer may be without a market for his product," but doesn't say when. The vigil of the Federal government, which is the only state-wide food inspection that amounts to much in this country, can protect only those who happen to buy their cream and butter in another state. Farmers selling at home are not going to regulate themselves to their advantage. Nor do they or the dairy industry see the wisdom of producing a wholesome product for the vastly greater market a more palatable article would command. In the Cincinnati case referred to, representatives of the state dairy industry reported with evident satisfaction, "By the greatest effort and all the pressure we could apply, we kept the affair out of the newspapers." Thus was the pressure of public opinion in righting a condition that needs remedying staved off for the time being. That will come later. In the meantime substitutes for dairy products will increase in favor.

THE Pennsylvania state health service will not permit the shipment of Ohio milk or cream into the state because the "extraneous material" it contains renders it, in the opinion of the Pennsylvania health authorities unfit for human food. This is a hardship on milk producers of the eastern counties of Ohio, for whom Pittsburgh is a desirable market. The Pennsylvania authorities will make an exception in the case of cream, the wholesomeness of which is certified to by the Ohio health commissioner; it is already certified by the state board of agriculture under inefficient regulations that have not been revised in twenty years.

Thus the task of the dairy industry of Ohio was rendered very simple. It could have a desirable interstate market and a greatly increased home market by (1) adopting methods of production acceptable to its state health department, or (2) by inducing (permitting) its agricultural department to promulgate and enforce regulations that the health department could approve.

The state dairy industry was aroused. It determined to do something—and went to the state legislature in force demanding an eight-cent a pound state tax on oleomargarine, the use of which has increased just one hundred per cent in Ohio within five years. The dairy representatives, dairy association officials and county agents were astonished when the heretofore complaisant solons refused their demand. They were astounded when individual legislators stated they wouldn't do anything to place butter substitutes out of reach of their poorly employed industrial and rural populations until butter that is fit to eat could be had on the market; stating that they, themselves, ate oleo because the butter they got in stores and restaurants of the state "was so rotten they couldn't eat it."

THE Ohio dairy industry can double its market by promoting an independent, state wide system of veterinary milk inspection. Instead it will probably concentrate on electing a "friendly" legislature a year hence.

Cream puffs, ice cream and fancy pastry take a considerable toll in digestive troubles of school children and infants, and just how much cow's dung adults eat with their butter is not easy to calculate. There is no veterinary service to look into such things, and agriculture is not likely to get excited over having one in operation.

RECENTLY the Borden Milk Company of Chicago left a neat card at the door of its customers stating that the dairy farms from which its milk was obtained "are inspected by graduate veterinarians." The significance of this informative pronouncement to the housewives of Chicago is that a private corporation does for the people what the public service leaves unaccomplished. Under the present setup, the farm leaders having charge of such things are not likely to condemn their own products nor revise the system that enables them to sell lethal ones. Some day the people will understand how illogical is the veterinary profession's hookup. It alone is qualified to determine the wholesomeness of many of the products of agriculture. Yet it must make the evaluation under the supervision and direction of the industry whose products it inspects. It is quite presumptious to suppose that the farm advisers who are employed by the farmers are in a position to take hold. It would be unnatural for the farmers to yield willingly the autonomous inspections they enjoy, at the urge of local health authorities; yet such a course would do more than anything else to inspire confidence in their products. "People must eat," surely, but they have a wide selection in the matter of the sources of their food.

The dirty cream question that is attracting some attention for the first time and the lack of a proper spirit in instituting reforms is a startling example of short-sighted insistence. Public health authorities and physicians everywhere could and would by their advice increase the consumption of dairy products enormously if they had full confidence in the wholesomeness of the market varieties.

The High Incidence of Trichinosis in Man

When the facts being elucidated by medical research on the incidence of human trichinosis become generally known, they are apt to startle the promotors of meat consumption, and perhaps draw public attention to the big gaps in our anti-scientific veterinary service.

Queen, J. B. (*Journal of Parasitology,* 1931), in making 344 consecutive autopsies (human) found 17 per cent of them parasitized with *Trichinella spiralis,* and Spink and Augustine (*Journ. Amer. Med. Assn.,* May 19, 1935), in reporting 35 clinical cases of trichinosis, that came under their observation, make the significant statement that the disease in man is not uncommon but has been frequently overlooked in patients showing an elevation of temperature with vague aches and pains of several weeks' duration.

Since the medical profession has worked out a precipitin test and also a cuti-reaction for the detection of trichinosis the time is approaching when its incidence will be exposed with greater exactitude than is possible from autopsies. The veterinary service will be ill at ease attempting to defend its silence when the consumers of pork in the natural course of events, begin to pry into the high incidence of trichinosis among them. Veterinary research which is maintained at enormous expense for and by all of the people is not expected to muzzle its personnel in matters of this sort. Yet, under the present hook up a liberal attitude is not apt to be adopted. Suppressing facts which might interfere with the "profits of agriculture and business" at the expense of public health is only postponing the evil hour, and hard on the faithful veterinarian. A system of veterinary medicine founded and operated on the principle that the delicate problems of prophylaxis should be delegated to the owners of animals is not apt to elevate itself to a very high level in the minds of the people. In the minds of scientific men, it is already a joke.

Agriculture and the Public Health

ONE of the most colorful figures in the veterinary profession at the present time is Doctor Roeland, member of the Municipal Council of Paris. By means of convincing arguments full of wisdom, wit and sarcasm, Roeland was able, several years ago, to arouse enough public interest in milk hygiene to break down the "hands off" program of the agrarian circle which was keeping the milk supply of that famous city in bad repute. In one of his published addresses he stated that "visitors from other countries bring their milk with them rather than drink the 'soup' of the Parisian dairyman." The salubrity of the milk supply of Paris was improved. Roeland won. Won from whom? Agriculture—the industry that has most to gain from an increased use of milk but fights measures for improving its quality to the last trench. The behavior of the agricultural crowd in this respect is so reactionary that urban populations may well ask if their health is safe in the hands of the present set up. The rural population does not even protect itself. It continues to consume uninspected meat and who knows how much "soup" as milk. Its infant death rate and its morbidity rate from filth borne disease far exceed those of urban populations. Its greatest interest in quality in food is shown by its large consumption of oleo in preference to butter of its own production. Milk hygiene, meat hygiene and animal hygiene have progressed somewhat but only so far as the opposition of agriculture could be broken down.

Roeland stirred the Parisians with these irrefutable arguments. He is now engaged in waging a pure-air campaign for children, emphasizing with his usual sarcasm that children who formerly played in the streets are driven to cover or crushed to death by the swift running automobiles, just as dogs are. Fresh air, sunlight, exercise and wholesome food, imperative needs of man, are denied them. Deprived of air, man lives but

two minutes; without water, he dies in a week; with no food he lingers a month or so; in the absence of sunlight, the human being can resist his anemia for a few years, but, he can survive a hundred years without house, clothing, moving pictures or newspapers. Land sells at so much a square meter. What is a cubic meter of fresh air worth? The one represents money, the other only health. Such are the colorful arguments of Roeland, the veterinarian, member of the Municipal Council of Paris.

THE fresh-air program for children is a reminder of the inglorious attitude of our agricultural circle toward public health measures, notwithstanding their meaning in total death rates, infant mortality and the ultimate vigor of the race. The townspeople are always on the defensive against agriculture in this respect. Chicago, among other cities, provided hundreds of acres of parks for the children to play in and thousands of acres of forest preserves in the interest of public health and comfort, and did so more than a generation before it was able to institute supervision over its own milk supply. There was no agricultural crowd to object to the play parks. Compare this with what agriculture did to the people of Chicago. In 1911, agricultural Illinois, champion of makeshift disease-control measures, compelled the state legislature to enact a statute forbidding Chicago to enforce a tuberculin test of cows supplying its milk and thus protect its youngsters against the hazards of tuberculous milk *vis-a-vis* a 20 to 65 per cent incidence of tuberculosis among the dairy cows of the surrounding territory. A few thousand more or fewer pitiable cripples from hip joint disease or spinal curvature among the children of the state, were matters of not the slightest concern to the state dairy association or its well-paid attorneys.

Today, Illinois cities enforce their milk ordinances in open violation of that law. The agricultural interests are impotent in the matter because with improved transportation facilities, Chicago can go elsewhere for its milk. Agriculture could, however, and does flaunt the author of the anti-tuberculin test law—Shurtleff—in the fact of the urban population by electing him to an important judgeship. Whereupon, the Health Commissioner of Chicago was enjoined, even in this day, from enforcing the tuberculin test ordinance and is threatened with arrest if he sets foot within the jurisdiction of the court.

THE Shurtleff law is one, however, a great urban population refuses to obey and the farmers dare not enforce because Chicago can obtain plenty of milk beyond the court's jurisdiction. The prospective loss of the market for their milk alone whipped the milk producers of the Chicago territory into submitting to the sanitary inspection provided by that city's milk ordinance, although an agricultural-controlled state legislature, apparently, is willing to enact any sort of anti-public health law that it is thought will help gain a market for agricultural products. Because interstate commerce is beyond its control and Wisconsin dairymen were willing to supply the big city's milk, Chicago's requirement that the dairies clean up was not outlawed, as was its earlier demand that the cows supplying its milk be tuberculin tested. Nowhere was the spirit of human kindness shown by the leaders of the agricultural group to the children of a population of 4,000,000, and yet, under the present alliance, it is that group, with its outwardly expressed hostility that conducts inspection for the remainder of the state.

There could be no objection to the present veterinary-agriculture hookup provided agriculture were disposed to manage the veterinary service for the general good instead of wantonly sacrificing the health of the American family in the short-sighted belief that it is helping itself.

We introduce our Parisian colleague, because every American community needs a Roeland. It needs a Roeland to teach the people that they are being double-crossed, not by the rank and file of farmers, but by leaders who have shown no mercy and precious little prescience in the execution of a trust.

A Practitioners' Association

By L. A. MERILLAT,
Chicago, Illinois

THERE is reward in independence and united action. The rural practitioners of the United States complain of their lot and have plenty of reasons for so doing. They are hampered by outside agencies which they cannot overcome. During the same years that the small animal branch of veterinary practice has been developing by leaps and bounds, rural practice has been sinking lower and lower. The one was running its own show, the other was managed by public functionaries—the agricultural extension service and its confederates.

Noting to what extent the rural practitioners were "hog tied," the small animal group formed an association of their own. It had studded the country with well-equipped, attractive hospitals representing considerable invested capital as well as a spirit of scientific progress that would not be safe in the hands of the farm advisers who, during the short period of their existence, have made a tumbled down shack of many an animal hospital all over the United States, and have thrown science to the four winds. The contrast is outstanding and significant.

Dogs, cats, birds and other pets, through the wisdom of the small animal practitioners, are getting a better break in private hands than the cows, horses and hogs are getting in the hands of the uninvited managers of the large animal group. By divorcing themselves from the demoralizing hookup that has been wrecking the progress of the rural practitioners, those in the small animal field have taken a step forward, that it seems important for others to take, also.

All that the public functionaries want the practitioners to do nowadays is the work which cannot be done from an easy chair by the farm adviser, or to validate the sale of a cow now and then because the county agent's certificate of health is not yet acceptable.

The truth of the matter is, the various branches of veterinary medicine are so different in their relations to personal welfare and professional progress that they part company from the word go. Such organizations as the American Animal Hospital Association, the Association of Bureau of Animal Industry Veterinarians, and the Association of State Veterinary Employes of Illinois, are the inevitable consequence of diverging interests.

Isn't it time for the rural practitioners to take an inventory? It seems important for them to make a survey of the problems concerning their particular line of work. The farmers need them, the state needs them, the federal government needs them and the army may need them. From the utilitarian point of view the position of the rural practitioners is impregnable and in numbers they constitute the vast majority, yet they are the group that not only prospers least but which has the most uncertain prospects. "They don't know where they're at" tells the whole story.

It would seem reasonable for them to be organized if for no other purpose than to study the way out, which may not be as difficult as it seems, if concerted action be taken. Such an organization would have to be nation-wide with state affiliations, and nothing would lend itself better for the purpose than a section in the national association devoted exclusively to a discussion of ways and means of establishing solid and amicable relations with the other branches of our veterinary service.

The veterinary profession is faced with conditions developed through lack of foresight of its own personnel dating back to the middle of the nineteenth century when the first veterinarians employed by the agricultural groups of the several states did not seize the opportunity of training specialists instead of agricultural students to admin-

ister treatment to sick animals. Obviously, agriculture wanted the best guidance available—and got the worst. As a consequence, it allowed a system of private veterinary education to fill the gap it, at least, should have attempted to fill. The upshot was the present disconnected mix up which is by no means accomplishing its purpose in spite of the many efforts to prove the contrary. The veterinary service of the United States is composed of an inexplicable conglomeration of conflicting interests that expend considerable energy defending themselves against one another, with the practitioner group taking the lion's share of the punishment.

Helping practitioners is not always an agreeable task. They take too little interest in national association work. The national association, through its postal card ballot, opens the way for them to elect a representative of their choice on the executive board. Many do not take the trouble to vote and too many do not even join the association. Obviously, the benefits derived seem too intangible to be appraised at par value, and thus the practitioner year after year, decade after decade, remains without any influential champion of his cause. The fault in this respect is his to endure. On the other hand, the accredited practitioner lives in fear of offending the authorities should he openly complain of his misfortunes. He can be taken off the accredited list for talking too much. To institute reforms, he will have to register his thoughts through the voice of an organization, and certainly no setup would be better adapted than the foregoing —a section of the A. V. M. A. Surely, where there is so much to set right, steps of some sort should be taken looking to that achievement. The graduate veterinarians of the United States are too important to the people to be kicked about as they now are and no one is apt to come to their rescue. Their hope lies in their own resourcefulness. There is plenty of evidence to invoke in their behalf, and unquestionably they can, if they will, mobilize enough influence within and without the profession to effect reforms sorely needed for them and for the country. The present setup is so full of holes it would prove quite vulnerable to concerted action of the clinical branch, the branch that does most of the work and gets the poorest consideration.

Let's Go!

* * * *

Veterinary Officers Promoted

The "Army Promotion Bill," S. 1404, enacted July 31, 1935, profoundly affected the commissioned personnel of the army veterinary service. By its provisions, it promoted 13 second lieutenants in the Veterinary Corps of the Regular Army to first lieutenants, and 646 second lieutenants in the Veterinary Reserve Corps to first lieutenants. It also abolished the grade of second lieutenant in the Veterinary Corps, so that in the future the grade of first lieutenant will be the lowest grade of officers in the army veterinary service.

When the National Defense Act of June 4, 1920 was passed by the Congress, the minimum educational requirement for matriculation in a veterinary college was the completion of four years of high school work, and the veterinary course was four years. Medical students at that time, as now, were required to have had two years of college work for entrance to medical college and a four-year medical course and a year of internship for graduation. Thus, seven years of schooling above the high school was required for appointment in the Medical Corps of the army in the grade of first lieutenant, and mainly for this reason, veterinary officers were required to serve three years in the grade of second lieutenant to place them on a par with medical officers.

Since 1920, all of the important veterinary schools have added one year of collegiate study to their entrance requirements and unofficially most of the schools have stated that at an early date the entrance requirements will be raised to two years of college work. Because of this prospect and because of the excellent record the Veterinary Corps of the Regular Army has made, the Congress has seen fit to advance the lowest

grade in the Veterinary Corps to first lieutenant, thus giving the veterinary student whose ambition is a career in the army, one-year advantage over the dental student and a two-year advantage over the medical student.

The War Department was no doubt in part influenced in making this recommendation to the Congress by the fact that at the present time, many of those taking up the study of veterinary medicine have two or three years of college work and a considerable number have a baccalaeureate degree to their credit, and that by offering veterinary officers the same advantages in appointment in the army that are accorded dental and medical officers, they are more apt to attract these better qualified men.

Appointment in the grade of first lieutenant, instead of second lieutenant, will make a commission in the army far more attractive to the newly graduated veterinarian and should result in more applications for the position. During recent years, it has been extremely difficult to fill vacancies in the Veterinary Corps with the type of officers desired in the army. Since appointment in the Regular Army can be made only from the Veterinary Reserve it should result in greater interest in that branch of the army.

* * * *

Modernization of Animal Hospitals

Veterinarians who maintain hospitals have an excellent opportunity to improve their property and service by modernization, which may be arranged through insured credit under the provisions of the National Housing Act. Approved lending institutions will advance the necessary sum virtually to rebuild and re-equip such properties.

The operation of the modernization credit plan is simple. The applicant makes known his desire to a bank or lending institution that is approved by the Federal Housing Administration, upon agreements with the institution making the advance, he has as long as five years within which to pay off the obligation. The interest charges combined with all other charges cannot be more than the equivalent of a discount of $5 per $100, which make this the lowest-priced installment credit ever offered. The money is repaid in equal monthly installments.

Veterinarians, of course, know the value of maintaining attractive efficiently equipped hospitals, but not all know how easily the credit for repair and modernization may be arranged. The aim of the Housing Administration and the lending institutions has been to make the credit simple and attractive, free from red tape, and to make the money available as soon after the application is made as possible.

Under the amended National Housing Act, sums up to $50,000 may be obtained for additions, alterations, repairs and improvements to real property improved by or to be converted into apartment or multiple family houses, hotels, office, business or other commercial buildings, hospitals (including veterinary hospitals), orphanages, colleges, schools, or manufacturing or industrial plants. The maximum limit for other classes of property is $2,000.

Purchase and installation of machinery and equipment in the types of property mentioned is eligible for modernization credit under the new regulations provided they are peculiarly adapted to the business conducted therein or necessary to the operation thereof.

The insurance clause of the regulations, by which the Housing Administration insures the credit agency against loss up to 20 per cent of its total modernization loans, has made the business desirable and credit has been readily extended. The facility of obtaining the desired funds for modernization and repair has in the same way made it highly attractive to persons wishing to better their property and business.

It is only necessary for the veterinarian to get an estimate of the cost of the work he wishes to do and consult any approved financial institution in his community. If the risk is a sound one, the credit will be advanced without delay.

Poultry Disease Problems Confronting the Veterinarian*

The Author

By F. D. PATTERSON, JR., Auburn, Alabama, Professor of Pathology, Alabama Polytechnic Institute.

THERE is no problem of greater importance to the poultry industry than that of disease control. Modern high-pressure methods that have been in use for the past ten or more years, violating practically every fundamental principle of good hygiene, are largely responsible for the present poultry disease situation. The success or failure of this great industry depends largely upon restraining diseases within reasonable bounds. If this is to be accomplished satisfactorily, veterinary practitioners must take a very prominent part. It can be said truthfully, that the effectiveness of poultry disease control in any local community is directly proportional to the ability of its local practitioner to handle this line of veterinary work. Fundamental training in diagnosis and disease control, such as that possessed by the veterinarian, is just as essential for poultry disease control as for the control of diseases of any other class of live stock. Besides this training, the veterinarian must be informed also on poultry husbandry in general. Errors in management, breeding, feeding, etc., are so closely linked with disease that they are inseparable. In many cases such errors are the most important factors to consider, and overcoming them is often the only really worthwhile measures that can be applied. In many cases, even though the present trouble has advanced beyond control, the practitioner can be of great assistance to his client by supplying information that will prevent future losses from similar causes.

THE following factors are of great importance in the control of poultry diseases and indicate the need for the type of training mentioned above.

Breeding.—Close imbreeding for high egg production, rapid growth and early maturity, without due regard to the egg size, general flock stamina, etc., has, in many instances, resulted in poor fertility, weak chicks, lowered constitutional vigor, lowered resistance to disease in general and in some flocks to an inherited susceptibility to certain serious infections. Such unwise breeding has often nullified the valuable factors sought. To have guarded against these undesirable traits would have necessitated the removal of some otherwise valuable breeding stock, and, of course, would have retarded progress toward the desired end, but it would have been much safer and, in the long run, more practical and more economical. Had the breeder eliminated undesirable traits as carefully as he fixed desirable traits, a more healthy situation would now exist. It would have been a slower route, but it would have resulted in a more substantial and enduring foundation.

Housing.—Crowding too many chickens in a house is one of the most common and disastrous errors encountered. Damp, dusty, insanitary quarters, insufficient direct sunlight and poor ventilation account for much of our disease troubles. Houses should be constructed so they can be moved easily where outside runs are used, to insure proper rotation of yards.

Poor Yard Sanitation. — Unclean runs; poor drainage, often resulting in stagnant pools; failure to adopt a proper rotation system, etc., contribute in a large measure to disease hazards.

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Diet.—A properly balanced diet is very important, both from the standpoint of deficiency diseases, and the general health of the flock. Too much forcing for high egg production, early maturity and rapid growth, by feeding rations excessively high in animal protein concentrates, combined with other high-pressure methods are, in my opinion, among the most important contributing factors to the present high mortality rates that prevail in intensive poultry plants. In many instances the mortality rate is too high for profitable production. The high mortality rate among pullets before they have completed their first laying year is probably due, either directly or indirectly, in a large measure, to high-pressure methods.

Chilling, Overheating and Crowding.—Any and all of these factors are responsible, either directly or indirectly, for many losses.

Incubation and Brooding. — The veterinarian should be familiar with incubation and brooding, because errors and accidents in their operation accounts for considerable losses.

General Measures for Poultry Disease Control

All errors of management should be corrected. Diseased birds should be isolated as soon as noted. Badly diseased birds should be killed and all carcasses should be burned as soon as possible. Houses should be cleaned and disinfected thoroughly, with emphasis on the cleaning. To clean a house properly, all litter, droppings and *debris* should be removed and burned or placed on fields that are not to be used as a poultry range. The inside of the house and the equipment should be scraped thoroughly, then scrubbed with a three-per-cent solution of lye and water, and then sprayed with a five-per-cent cresol solution or other suitable disinfectant. Disinfection, to be of much value, must be preceded by thorough cleaning. Feed and water utensils should be scalded frequently. Crowded quarters should be relieved. The flock should be divided into small groups when possible. This is a great advantage in outbreaks of infectious disease. Proper housing is the most important factor in the prevention and control of infectious respiratory diseases.

All new birds should be quarantined for a reasonable period.

Birds that have recovered from certain infectious diseases, such as cholera, fowl typhoid, pullorum disease, infectious laryngotracheitis, etc., are a potential danger because they are often chronic carriers of the disease. This is one of the most important reasons why it is advisable to rear chicks on clean ground away from all other poultry and to house the pullets of the current year separate from older birds.

INTESTINAL parasites are best controlled by proper hygiene and sanitation. The adoption of a suitable system of yard rotation is of great importance where birds are allowed to range on the ground. When drugs are used, kamala for tapeworms and nicotine sulphate for round worms, are probably the most suitable ones. However, it must be remembered that potent anthelmintics may curtail egg production markedly and throw the birds into a premature molt. Other serious consequences also may occur unless anthelmintics be judiciously used.

The most important measures in the control of coccidiosis are the principles suggested for the control of infectious diseases in general. Emphasis should be placed on dry, roomy and well ventilated quarters, isolation, dividing the flock into small units and enforcing cleanliness rigidly. As in any other acute infectious disease, the curtailment of excessive quantities of animal protein concentrates, feeding plenty of grain and succulent green foods, should be helpful. The feeding of large quantities of powdered buttermilk is of doubtful value.

EXTERNAL parasites: Lice are best controlled by the use of sodium fluoride on the birds or by painting the perch poles with black leaf 40. Henhouse mites can be controlled by painting or spraying the inside of the house and the equipment with a mixture of kerosene oil and crude oil. The crude oil is thinned with kerosene sufficiently to permit it to be sprayed with ease. Kerosene applied to the feet and legs of

chickens infested with scaly leg mites gives very satisfactory results in controlling these parasites. Care should be taken to avoid getting the kerosene on the skin of the feathered portions of the fowl, since severe blistering of the skin may result if this occurs.

IN COMBATTING infectious laryngotracheitis, emphasis should be placed on fresh air, proper house temperature, direct sunlight and clean roomy quarters. A vaccine prepared and administered according to the method of Beaudette is said to possess marked protective powers.

AN EFFECTIVE vaccine is now available for the prevention of fowl pox. However, the birds should be in good general condition when it is administered, otherwise bad results may follow. The removal of the scabs and pseudomembranes, that result from fowl pox infection, and swabbing the parts with equal parts of tincture of iodine and glycerine is of some value in the treatment of this disease.

AVIAN tuberculosis: Beside the general principles used in controlling infectious diseases, much can be done toward the eradication of tuberculosis from a flock by rigid culling throughout the year, removing all clinically suspected birds as soon as noted. In badly infected flocks the elimination of all hens as soon as they have completed their first laying year is of great value. The judicious use of the avian tuberculin test is a valuable aid in detecting infected birds. However, it does not seem advisable at the present time to advocate compulsory testing, though it may become desirable in time.

RICKETS is prevented and controlled by exposure to direct sunlight or by incorporating potent cod liver oil or sardine oil in the ration. Mineral supplements in the ration, particularly calcium, are important. Forcing for very rapid growth, chilling and overcrowding are factor contributing to the development of rickets and should be corrected as far as possible for best results.

VITAMIN A deficiency disease can be prevented and controlled by feeding sufficient fresh greens and cod liver oil. Yellow corn is also of value.

MUCH progress has been made in some states in the control of pullorum disease by the proper use of the agglutination test, combined with good hygiene and sanitation.

HENS in heavy production, that are fed rations containing a very high percentage of animal protein concentrates, are frequently affected with a certain type of bumblefoot. This type of bumblefoot seems to be particularly common in S. C. White Leghorn hens. It seems to be associated with heavy production and forcing diets. It is characterized by abscesses of the feet and, apparently, is controlled best by opening the abscesses freely, removing the pus and packing the cavity with cotton saturated with tincture of iodine. Reducing the animal protein concentrates in the ration and feeding plenty grain and fresh green foods, are important when the disease becomes very extensive in a flock.

FOWL leucosis has become one of our most important disease problems and may be classified according to the following types:

1. Myeloid type. This type is characterized by the appearance of immature blood cells of the granulocyte series in the blood and other tissues. Neoplastic-like formations are often found and may or may not be associated with the involvement of the blood. Myelocytomas are observed in some cases of this type. The liver, spleen, kidneys, bone marrow and blood are the organs or tissues most commonly involved, though the lesions are by no means confined to them.

2. Erythroid type, or erythroleucosis, is characterized by the appearance of immature blood cells of the erythrocyte series in the blood, anemia, emaciation, icterus, etc. The bone marrow, blood, liver and spleen are the organs most commonly involved. Lymphoid-like, neoplastic nodules

and infiltrations are not infrequently noted in the various organs and tissues.

3. Lymphoid-like type. This type is characterized by lymphoid-like neoplastic nodules and infiltrations in the various organs and tissues. Practically any organ or tissue may be involved. The most characteristic cellular elements are undifferentiated lymphoid-like cells. The neoplastic-like lesions found in the nerves of so-called range paralysis cases, belong to the lymphoid-like type. We designate these lesions according to location, as the nerve type, and the lesions characterized by iritis, depigmentation of the iris, constricted malformed pupils and impaired vision, as the eye type.

4. Mixed types are those in which any combination of the above types may be found.

Fowl leucosis is an infectious disease and the evidence thus far obtained indicates that the etiological agent is in the nature of a filterable virus. It is certainly not a deficiency disease, neither is it caused by intestinal parasites or coccidia, though they may facilitate the entrance of the etiological agent in some cases by mechanically injuring the mucous membrane of the intestine. It is possible that coccidia may act as incidental carriers in some cases, though they certainly do not act as a specific intermediate host. This disease is characterized by its malignant neoplastic-like tendencies.

Besides the control measures suggested for the control of infectious diseases in general, the principal means of controlling fowl leucosis is to attempt to build up strains resistant to the infection by selection and elimination. There are marked inherent differences in the degree of resistance or susceptibility of certain individuals and strains to the development of this disease. This fact offers us our greatest hope in controlling it. The mere fact that fowl leucocis has never been observed in a certain flock does not necessarily mean that such flocks are highly resistant. It may simply mean that the fowls have not been sufficiently exposed to contract the disease, and if the owner of a badly infected flock discards all his fowl and replaces them with stock from such a leucosis-free flock, he may find himself in worse shape than before. However, strains that possess marked resistance to fowl leucosis are sometimes found, and when they are, it is advisable to replace flocks that are badly infected with any type of leucosis with birds from such a highly resistant strain, because building up a resistant flock from a highly susceptible strain by selection is often a slow process.

Biological and Medicinal Agents

The beneficial effects apparent from the use of biological and medicinal agents are often more psychological than real. However, their use for the former effect alone may be justified sometimes to insure the institution of more valuable measures; proper hygiene and sanitation. They may also be justified to prevent the client from administering harmful agents. In regard to biologics in poultry practice, there are two of known value. They are fowl pox vaccine and the Beaudette vaccine against infectious laryngotracheitis. There is some evidence that fowl typhoid bacterin possesses practical value. Regardless of what we use, we should never neglect to institute proper hygiene and sanitation. While certain biological products used in medicine have great value in controlling diseases, I do not recall an instance in veterinary medicine where a disease has been eradicated by the use of such agents alone, though in some instances they may have contributed materially to that end. Thus far the radical methods of desease eradication used by American veterinarians have proved more effective and economical. In some instances biological products, even though they may possess considerable protective and curative powers, may impede rather than facilitate eradication of some diseases. I do not desire, by any means, to leave the impression that I am opposed to all medicines and biologic agents, because I am fully aware of the tremendous value some of them have in the control of disease. I merely wish to call your attention to other valuable factors and to the limitations of pharmaceutical or biological agents in many instances.

Carbon Disulphide for the Removal of Stomach Worms From Swine

By JOHN BOZICEVICH and WILLARD H. WRIGHT,
Zoological Division, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

THE swine stomach worms, *Hyostrongylus rubidus, Ascarops strongylina* and *Physocephalus sexalatus,* are widely distributed in the United States and appear to be particularly prevalent in southern hogs. Data concerning the incidence of these parasites in swine in different sections of the country are lacking for the most part, although Spindler (1934) reported the occurrence of these three species of parasites in hogs from the southeastern United States, principally from southern Georgia and northern Florida. Of 348 hogs examined post mortem, Spindler found 15 per cent to be infested with *H. rubidus,* 53 per cent with *A. strongylina,* and 47 per cent with *P. sexalatus.*

Various pathologic conditions have been ascribed to the presence of these worms in the stomach of swine, and there appears little doubt that the worms, either alone or in association with other parasites, contribute to the general unthriftiness and lack of development observed frequently in parasitized swine. Lack of knowledge concerning any effective treatment for the removal of these worms, led the writers to undertake the investigations recorded in this paper. While *P. sexalatus* was not present in any of our experimental pigs, it would appear probable that the results obtained in treatments for infestations with the other two species would be obtained with this species also, and this possibility should be given experimental test.

Review of literature.—Several workers have suggested various anthelmintics for the removal of stomach worms from swine. Marek (1921) used distol, a proprietary preparation, against *H. rubidus* but found that the drug had no effect on this parasite. Wolffhügel (1924) in tests of drugs designed for the removal of the thorn-headed worm, *Macracanthorynchus hirudinaceous,* gave an eight to nine months old pig 90 grams of carbon disulphide in olive oil in divided doses over a period of four days, followed, 12 days after the administration of the first dose, by 100 grams of the same drug in castor oil; specimens of *A. strongylina* recovered from the stomach of the pig at necropsy were dead. Wolffhügel also recovered dead *A. strongylina* from a pig given picric acid in three doses over a period of six days. Le Roux (1930) suggested the use of one part oil of chenopodium and 16 parts of castor oil for the treatment of stomach worm infestation in swine. Kotlán and Móscy (1933) stated that an 0.5 per cent solution of iodine in liquid paraffin is of value for the removal of *H. rubidus* from swine.

Experimental procedure.—Swine used in the experiments reported in this paper were fasted for varying periods of time prior to the administration of the drug. At the beginning of the tests both food and water were withheld prior to treatment; later it was found that allowing water had no effect on the efficacy of the treatment. Consequently, in the remainder of the tests the animals were permitted to consume water at will during the preliminary period of fasting.

In most of the tests, the carbon disulphide was administered by stomach tube, followed by 15cc of water to wash out the tube; in a few cases, the drug was administered in hard gelatin capsules. The animals were held for varying periods of time after treatment and were then slaughtered to observe the efficacy of the treatment. During the period between treatment and slaughter, no food or water was given.

Immediately following slaughter of the

experimental pigs, the stomach and approximately 15 feet of the small intestine were removed. These organs were opened separately and the contents examined, a small portion at a time, in physiologic saline solution maintained at a temperature of 38° C. The stomach was examined in warm saline for the presence of any worms attached to the mucous surface. If the worms recovered in the warm saline solution did not move under stimulation of the warmth within a period of 15 minutes, they were considered dead.

Results of experiments.—Table 1 presents the results obtained in tests on 30 pigs treated with carbon disulphide. Varying dose rates of the drug were used in order to determine the minimum effective dose rate for the destruction of both *H. rubidus* and *A. strongylina.*

It was found that the presence of food or other material in the stomach had the effect of diminishing materially the efficacy of the treatment, as indicated in the cases of pigs 23, 24 and 29. On post-mortem examination, pigs 23 and 29 were found to have a considerable quantity of fecal material in the stomach. Pig 24 was inadvertently placed in a pen bedded with straw and evidently consumed a considerable quantity of that material, since straw was found in the stomach on necropsy. It seems probable that the low efficacies of carbon disulphide against *H. rubidus* in these 3 pigs were due to the foreign material in the stomach at the time of treatment. In order that the stomach may be absolutely empty at the time of treatment, it would appear that animals should be fasted for a period of 36 hours prior to the administration of the drug and should be so held that they will be unable to consume any fecal material passed during that time.

Taking the average results at all dose rates employed, carbon disulphide was 85.8 per cent effective against *H. rubidus* and 96.4 per cent effective against *A. strongylina.* The drug was found to be more consistently effective for the destruction of *A. strongylina* than it was for *H. rubidus.* This result might be expected because of the relatively small size of *H. rubidus,* and the fact that worms of this species are more or less protected by the thick gastric mucus produced as a result of the catarrhal condition caused by the parasites.

A consideration of Table 1 indicates that the minimum dose rate for a satisfactory efficacy lies in the neighborhood of 0.1cc per kilogram or 4.5cc per 100 pounds of body weight. The best results were obtained with a dose rate of 0.2cc per kilogram or 9cc per 100 pounds of body weight. However, two animals (pigs 29 and 30) out of four animals treated with doses of 0.2 to 0.22cc per kilogram of body weight, showed marked reactions to the treatment. In only two pigs (14 and 20) treated with doses lower than 0.2cc per kilogram of body weight, was there any reaction observed following treatment. These pigs showed dizziness and one of them vomited. It would appear from the data at our disposal that pigs may be treated with safety with carbon disulphide at a dose rate of 0.1cc per kilogram of body weight and that the drug at this dose rate will give an efficacy approximating 90 per cent for *H. rubidus* and even a higher efficacy for *A. strongylina.*

Gross pathology.—Carbon disulphide is a local irritant to the gastric mucosa, and varying degrees of gastritis were observed in 27 of the 30 pigs at post-mortem examination one to four hours after treatment. However, evidence would seem to indicate that the gastritis is rather transitory. In one pig treated with carbon disulphide at a dose rate of 0.2cc per kilogram of body weight and held for five days after treatment, the stomach was normal at necropsy. In a few cases there was a slight enteritis which was confined to the upper part of the duodenum.

Summary and conclusions.—Carbon disulphide administered by stomach tube or in capsule to 30 swine at dose rates varying from 0.027 to 0.22cc per kilogram of body weight, after a preliminary fast of 30 to 48 hours, showed an average efficacy of 85.8 per cent for the destruction of *Hyostrongylus rubidus* and 96.4 per cent for *Ascarops strongylina.* While none of the pigs employed in these tests were infested with *Physocephalus sexalatus,* it would ap-

TABLE 1.—PROTOCOLS OF ANTHELMINTIC TESTS WITH CARBON DISULPHIDE FOR THE REMOVAL OF STOMACH WORMS FROM SWINE

No. of animal	Period of fasting (hours)	Dose per kgm. body weight (c. c.)	Total dose (c. c.)	Period held before slaughter (hours)	Worms recovered				Efficacy of treatment		Effect on host
					Hyostrongylus rubidus		*Ascarops strongylina*		*H. rubidus* Per cent	*A. strongylina* Per cent	
					Alive	Dead	Alive	Dead			
1	48	0.027	5	5	38	27	.....	.....	41.5	.....	
2	48	0.04	5	5	43	37	0	3	46.2	100	
3	48	0.05	10	5	2	137	0	8	98.6	100	
4	48	0.05	5	5	76	69	.....	.....	47.6	.....	
5	48	0.06	10	4	4	94	0	6	95.9	100	
6	48	0.06	10	4	2	4	.....	.....	66.6	.....	
7	48	0.08	10	5	2	276	0	6	99.3	100	
8	48	0.08	20	5	0	21	0	2	100	100	
9	48	0.08	20	4	2	4	1	9	66.6	90	
10	48	0 09	20	4	2	7	0	5	77.8	100	
11	48	0.10	5	5½	1	42	.....	.....	97.7	.....	
12	48	0.11	20	5	0	7	.....	.....	100	.....	
13	48	0.11	4.3	3	0	2	0	1	100	100	
14	30	0.11	4.9	4	.....	.....	0	5	.....	100	Vomited, dizzy
15	48	0.11	4.15	4	1	3	.....	.....	75	.....	
16	36	0.11	2.35	2	3	1	.....	.....	25	.....	
17	36	0.13	12	3	51	422	.....	.....	89.2	.....	
18	48	0.15	8.25	3½	1	5	0	2	83.3	100	
19	48	0.15	6.61	3	0	8	.....	.....	100	.....	
20	48	0.15	2.4	4	.....	.....	1	16	.....	94.1	Vomited, dizzy
21	48	0.15	4.8	3½	0	2	0	7	100	100	
22	48	0.15	4.3	4	0	8	.....	.....	100	.....	
23	48	0.15	3.43	3	4	1	0	1	20	100	
24	48	0.15	5.25	4	1	1	.....	.....	50	.....	
25	48	0.15	5.74	4	0	2	.....	.....	100	.....	
26	44	0.17	19.48	2	3	10	.....	.....	77	.....	
27	36	0.2	11.7	3½	.....	.....	1	5	.....	83.3	
28	36	0.2	17	3	2	243	.....	.....	99.1	.....	
29	36	0.2	9.2	1	1	0	0	2	0	100	Dizzy, animal down; breathing heavily
30	36	0.22	22	2	0	6	0	3	100	100	Slightly dizzy; foamed at the mouth
				Totals	239	1439	3	81	85.8	96.4	

pear probable that the drug would be effective against this species also; naturally this requires experimental demonstration.

Four of 30 pigs showed reactions to the treatment; these reactions consisted of vomiting, dizziness and, in one case, prostration. Two of these pigs received the highest dose rates employed, i. e., dose rates of 0.2 to 0.22cc per kilogram of body weight.

Gastritis of varying degree was observed in 27 of the 30 pigs treated with carbon disulphide. The available evidence indicates that the gastritis is transitory and probably not of serious import.

It appears that the minimum dose rate at which the drug can be administered with safety in order to obtain satisfactory results for the destruction of swine stomach worms, is 0.1cc per kilogram or 4.5cc per 100 pounds of body weight.

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Operation for Paralysis of the Penis of the Dog

Paralysis of the penis is found most frequently in puppies that are improperly fed or those heavily infested with parasites. Most of these cases respond promptly to removal of the cause.

In those where paralysis is complete and after being cleansed and returned to its sheath, the organ cannot be retained within the prepuce, one suture at the end of the sheath is often all that is necessary to keep it in place. This will permit urination and irrigation of the sheath with a very mild antiseptic, in case the mucous membrane covering the penis has been denuded, irritated or infected.

It was not acute paralysis, but one of chronic paresis that prompted me to report the following case:

The patient, a toy poodle about seven years old, had been suffering from a partial paralysis of the penis for more than two years, according to the owner. The organ being constantly exposed (not enough to hang pendulous) became dry, inflamed and bled frequently. Hair not infrequently became tangled and wound around causing partial strangulation, keeping the end engorged with blood. Then the constant licking of the hyperemic parts kept the animal in a more or less perpetual state of sexual excitement.

Treatment: The dog was placed under general anesthesia. A probe was pushed in the sheath along the ventral surface of the penis as far as it was possible with gentle pressure and withdrawn to explore its boundaries. Then an incision was made at the proximal ventral aspect of the prepuce parallel with its length for about one and one-quarter inch. The penis was then withdrawn through the artificial opening. The mucous membrane was carefully removed from the dorsal and lateral portion of the penis above the incision and posterior to the bulbous portion of the corpus cavernosum, being careful to leave the mucous membrane on the ventral portion.

The mucous membrane of the sheath in apposition to the denuded portion of the penis was then removed in the same way, but being careful to leave the mucous membrane lining the ventral aspect of the sheath. This is necessary to form a canal through which the mucous from the extreme proximal portion of the prepuce can escape to the free portion of the sheath. Otherwise a mucous cyst will form after adhesions developed between the raw portions of the prepuce and the penis.

After the penis was restored to its normal position, one suture was placed in the end of the prepuce to partially close its orifice. The ventral incision was left open. It may be well to state that at no time should a suture include the penis and to caution against cutting into the tissue of the corpus cavernosum as hemorrhage of this tissue is difficult to control and healing is slow.

The suture at end of prepuce was removed in a week, and to my disappointment healing had not taken place by first intention, but after two or three weeks the penis was drawn back into the sheath completely by cicatricial tissue. The ventral incision healed quickly.

This animal lived for nine years after the operation and experienced no more trouble with those parts.

F. G. Steinbach,
Wildwood Crest, N. J.

Ulcerative Enteritis in Ruffed Grouse

By EMMETT K. LeDUNE.
Delmar, New York

AS WILD LIFE Research Pathologist and Parasitologist of the Ohio State Conservation Department, I was called to the Urbana Game Farm in Champaign County to investigate an outbreak of disease that was fast depleting the young ruffed grouse being raised in confinement.

These birds were restricted to a small wooden house (approximately 9 ft. by 9 ft.) and an enclosure made of hardware cloth (9 ft. by 12 ft.). The floor of both house and run consisted of hardware cloth placed about 18 inches above the ground. Each pen contained six to 12 birds ranging in age from eight to 15 weeks. Their food consisted of buckwheat (green in the bloom and finely chopped), apple leaves, chopped tomatoes and apples, along with prepared scratch feed which was kept in front of them at all times. The drinking water contained a disinfectant (B.K.) in the dilution of one teaspoonful to each gallon of water.

Upon my arrival I was informed by Mr. M. B. Trautman, who was in charge of the birds, that some had died from one pen and had been immediately burned. The rest of the grouse in the same pen appeared droopy, ate little, sat around with necks and heads retracted somewhat into their body, eyes partly closed and feathers ruffed until they looked almost twice their normal size. The birds emitted a "cheeping" sound at short intervals. In this pen (which was some distance from the others) I noticed two birds that seemed less lively than the others, but having no available pens other than the ones containing healthy birds, and not wishing to spread any contagion, it was decided to leave them in the original pen. Careful watch was kept all through the day and at intervals during the night and it was apparent that these two grouse were becoming much weaker. At daybreak the following day one of the birds died and was immediately autopsied. The lesions found were as follows:

Autopsy of Bird No. 20304.—This bird was extremely emaciated. Its feathers were dry, harsh, glossless, very unlike the feathers of a healthy grouse. The skin was decidedly wrinkled and bluish-white in color, with a dryness that was almost bordering on dermatitis in intensity. Its legs were dry and scaly, although no *Sarcoptes mutans* could be found. The headgear was bluish-white and in some parts definitely cyanotic. Its eyes were watery and retracted into the orbital cavities. I noticed no discharge from either of the nasal cavities or the mouth, but there was a dark, watery, gelatinous material escaping from the bowels. No ectoparasites could be found.

Upon eviceration the liver was found to be congested and contained six yellowish spots about the size of a grain of wheat. The heart was somewhat light in color and contained several (12 to 15) petechial spots. The lungs were congested. The kidneys showed albuminous degeneration and were slightly enlarged. The spleen appeared normal. Investigation of the intestines revealed numerous (30 to 40) severe ulcerations, especially anterior to the cecal opening, with several being noted posteriorly. The intestinal veins were injected. The anterior part of the small intestines exhibited several small, roundish hemorrhagic spots accompanied by catarrhal inflammation and some free blood. The middle third of the intestines contained severe catarrhal hemorrhagic enteritis with ulcerations posterior to this, which could be seen easily through the peritoneal covering of the intestine, with one perforation of the intestinal wall by an ulcer. The cecae were well filled and somewhat distended with a dark semi-fluid material and much gas but no free blood could be found. There was no fluid in the thoracic cavity and a very small amount in the abdominal cavity, which possibly had escaped through the opening in the intestinal wall made by the ulcer. There were present a few (6) Ascarides (*Ascaridia lineata*). Quite a number of capillaria (sp.) were seen, although I do not think enough to have caused the death of the bird.

Shortly after the autopsy on the first ruffed grouse, the second one which had been noticed the day before died and post-mortem was held. This bird showed almost the same action on ante-mortem as the first and the post-mortem lesions were very similar:

Autopsy of Bird No. 20303.—There was marked emaciation; feathers ruffed; headgear light; skin bluish-white and wrinkled; eyes watery and retracted; no nasal or oral discharge, but the bowels discharged a watery fecal material. No ectoparasites were found.

The liver was congested but contained no yellowish spots as found in the first bird. The heart was normal except for a few petechiae on the

pericardium. The lungs were congested. The kidneys showed albuminous degeneration with a few petechial spots scattered over both. The spleen was normal. The intestines viewed before opening showed yellowish-white circumscribed areas through the peritoneal covering of the posterior portion of them and also the cecae. Upon incising the intestines the spots were found to be ulcers from the diameter of a lead pencil to three or four times as large, possibly two or more coalescing, forming one large ulcer. There were between 30 and 50 ulcers in the entire intestine and cecae. The intestines contained a watery, frothy, semi-gelatinous substance with a very fetid odor. The anterior and middle thirds of the bowels exhibited hemorrhagic and catarrhal enteritis with a few small ulcers the size of a millet seed.

Third Annual All-Day Clinic, Mississippi Valley Veterinary Medical Association, Peoria, Illinois, May 23, 1935. Rain most of the day did not interfere with this clinic held in the immense live stock pavilion at the Fair Grounds. Dr. A. T. Peters, general factotum, was ably assisted by Drs. J. W. Lucas, chairman, and W. O. Hilyard, clerk of the clinic committee. The operators included Dr. J. S. Anderson, Lincoln, Nebr., Dr. J. D. Roy, Omaha, Nebr., and many Illinois practitioners.

There were several *Ascardia lineata* and *Trichuridae* tentatively diagnosed as *Capillaria strumosa*. Examination of over a dozen slides for the presence of Coccidiosis was made, with negative results for both birds.

Post-mortem examinations of other birds occupying this pen were held as fast as they died. All showed identical ante- and post-mortem lesions except for a variation of spots on the livers. Some birds showed many spots, others only a few, while in some the liver appeared normal. The diagnosis, based upon the pathological lesions found, was death due to ulcerative enteritis, so-called "Quail disease." Due to a shortage of birds, the Department of Conservation did not deem it advisable to try experimental transmission of this disease to grouse or other birds.

From the very beginning utmost care was exercised in preventing spread of this disease to other pens. The attendant changed clothes and shoes and disinfected thoroughly before attending other pens. The fire gun was used on food and water containers after every feeding. The entire building and run, including the hardware cloth, was flamed daily while the birds lived—ten days. The ground beneath the run was flamed frequently and thoroughly soaked with a 10% solution of Liquor Cresolis Compositis. All dead birds were burned. In this way we were able to definitely control the outbreak of the disease with a comparatively small loss. Close watch was kept over all birds for several weeks, but no more losses occurred from ulcerative enteritis.

It is my opinion, to wage a victorious campaign against this disease, the essentials are, early recognition of the disease, followed by immediate segregation of birds and drastic sanitary measures with frequent use of the fire gun and extra-strong disinfectants.

Recent Advances in Canine Medicine and Surgery*

By GEORGE WATSON LITTLE,
New York City

FEAR has been expressed as to the danger of overcrowding in the field of small animal practice. Until recently I entertained such fears. Now I am firm in the belief that this condition will rectify itself. From now on there will be a weeding out of the incompetent. We are on the threshold of a new era based upon precision in diagnosis. It spells the banishment of arm chair opinions. The man who thinks that he can stand on his two feet and render a shrewd guess to his client, and get away with it, is just guessing wrong. Influences are at work, almost imperceptibly Those quick to perceive the handwriting on the wall will prosper beyond their expectations. The others will become casualties.

It is not a bright outlook for the newly graduated veterinarian who thinks that all he need do is build a fine roadside hospital. Our universities are not to blame; they cannot guide, but only advise as to the career that the young graduate should pursue. The universities are not designed, equipped or endowed to teach men the intricacies of small animal practice. The time is too short. In the future our best small animal practitioners will require a baccalaureate and veterinary degree and one to two years as interne on the staff of an efficient small animal hospital. Those of us who find ourselves thoroughly entrenched today will do well to keep our eyes open to competition tomorrow, competition with thoroughly equipped younger men, the number of whom is ever increasing. We can meet this competition only by gradually gathering around us a staff of younger men *more brilliant than ourselves,* as technical assistants. Younger men schooled in the intricacies of parasitology, special pathology, physics, chemistry, hematology and immunology are needed. The established practitioner will thus be able to retain the confidence of his clients and find himself in the happy situation of helping younger men.

A PUPPY (any breed) is presented for diagnosis and treatment. The owner wishes above all *results,* fee secondary. Once in a while we do encounter such cases.

The doctor may make his most serious mistake by taking the animal from the presence of the owner for examination. Whatever is done in the examination of this puppy, whether it be examining the feces for ova of intestinal parasites, drawing the urine for analysis, taking of a sample for a blood count or for examination for filariasis, examination under the fluoroscope, hypodermic injections, intestinal lavage or even major surgical operations, that examination or procedure, in my opinion, should be performed in the presence of the owner. She should be given the opportunity to observe, if she wishes, what is done to solve the problem of diagnosis and treatment.

Confidence is engendered by thoroughness rather than by mystery. A certain element of the public expect to be fooled, deceived and exploited and seem to like it, but any one who believes he can bluff his way through with careless or false opinions, even false, printed fecal and urine analyses, will in the long run find his clients speak nothing but ill of him. We have men in this metropolitan area who have conducted their practices in this manner for years, but their race is pretty nearly run. Better service is fast becoming more prevalent and the bluffer's bluff is being called more and more frequently.

*Presented at the Long Island Veterinary Medical Ass'n., Freeport, L. I., April 4, 1935.

IMPROVEMENTS have been made in the treatment and the technique of treatment of many of the ailments we encounter from day to day. The administration of remedies has changed notably, making it imperative for the owner to bring the animal to our hospitals for treatment. Subcutaneous, intraperitoneal and intravenous medication produce more rapid and better results than formerly were obtained. Gastro-intestinal lavage is coming to be appreciated more and more. Specific therapy is ever becoming more common. As examples one may cite:

1. Carbon tetrachloride and latterly tetrachlorethylene for hookworms and ascarids.
2. Arecoline hydrobromide and gastro-intestinal lavage for tapeworm infestation.
3. The use of Fuadin in the treatment of filariasis.
4. The use of a dispersed solution of silver oxide in the treatment of coccidiosis.
5. The use of an ointment of dispersed silver oxide in parasitic and non-parasitic ear canker.
6. The use of weak hypo-chlorite solutions in ulcerative keratitis.
7. Intravenous medication via the jugular vein.
8. Intratracheal anesthesia as demonstrated by Goubeaud.
9. The use of Nembutal in more accurate dosage as demonstrated by Schnelle.
10. Improved methods in the treatment of fractures as demonstrated by Schroeder.
11. Radiology in diagnosis as demonstrated by Schnelle.
12. A better understanding of vitamins and their application and necessity in small animal medicine.
13. A better understanding of application of endocrines.
14. Recovery of foreign bodies in the stomach by the aid of the fluoroscope and forceps under complete Nembutal anesthesia obviating the necessity of gastrotomy.
15. The use of electro-coagulation methods in anastomoses operations as described by Carabba.
16. Improved aseptic technique in surgery.
17. Scarless healing and a better choice of suture material.
18. The removal of follicular mange from the list of incurable skin diseases, and the speeding up of recovery from this condition.

AMPLIFYING the discussion of the many new methods which have come into use recently would take unduly long, but there are some innovations it may be profitable to enlarge upon.

Now and then we find an unusually stubborn case of parasitic or non-parasitic canker of the ear. Many preparations have distinct merit in the treatment of such cases, but one that seems to be outstanding is a 5% ointment of dispersed silver oxide. The ears are cleaned thoroughly with a non-irritating antiseptic and the ointment placed deep down in the canal and covered with absorbent cotton and an earcap applied. Each day a new dressing is applied, being sure to cleanse the ears thoroughly, removing every vestige of stale ointment and repeating the process.

A WEAK hypochlorite solution, one to three teaspoons to four to six ounces of warm water, is quite valuable as a frequent application to the cornea in ulcerative keratitis. Used two or three times daily in place of the usual boric acid solution, the results are gratifying. One of the most common hypochlorite solutions is Zonite. It does not interfere with the use of opthalmic ointment such as 1% atropine, anesthesine and adrenalin or the mercurials. Even when the hypochlorite solution is the only medication used, the results are quite satisfactory.

THE simplicity of intravenous medication via the jugular vein is spectacular. Many medicaments that were formerly given hypodermically are better administered in this way. To be able to prepare an animal for a major or minor surgical operation in the short space of 30 seconds in the presence of the owner and being assured of profound anesthesia for a long and difficult operation has distinct advantages. Administration via the jugular vein is just as practical and simple in the dog as it is in the horse. The jugular notch and furrow are quite distinct in the dog. By placing the thumb in the jugular furrow at the jugular notch the vein fills rapidly. With the patient in the sitting position, an attendant lifts the head by the chin. The jugular area having been clipped, shaved and antiseptic applied, a 21-gauge, two-inch needle, by a quick thrust will pierce the skin and vein at the same time; or if it doesn't, the vein is pierced by a few quick thrusts after the needle is under the skin. The angle of thrust of the needle is such as will allow the width

of the index finger between the shank and the skin of the jugular furrow region.

The jugular method will allow of the introduction of large quantities of serum, saline solutions, etc., within the space of a few minutes. It is much easier to strike the jugular than to pick up the saphena vein.

THE technique of Doctor Schnelle in the use of Nembutal is impressive. Instead of weighing the dog and measuring the dose, he introduces the Nembutal by injecting the solution very slowly till the desired degree of anesthesia is produced.

SCARLESS surgery is within the realm of possibility for all. In abdominal operations it is better to suture the peritoneum, muscle and skin separately. A continuous lock stitch of No. 00 plain catgut will suffice for the peritoneum, a No. 00 10-day gut for the muscle and preferably silk for the skin. Stitch scars and gaping of the wound are avoided by two deep, interrupted, mattress sutures of silk placed at the points of stress. These are carried through the skin and muscle about 1cm back from the edges of the wound and tied with flat surgical knots with long ends. A continuous mattress stitch very near the wound margin precludes the necessity of sewing over the edges of the wound except at the ends which are tied. In 48 hours the two deep interrupted skin and muscle, mattress sutures are removed so that the stress then falls on the continuous mattress suture. The edges of the wound then remain approximated without interference in the healing by any cutting of the edges by the stitches.

THE treatment of acariasis or follicular mange is a live issue. Some still hold to the opinion that this skin disease is incurable. They should learn better. Sulphuric acid in alcohol, 1 to 64 with a small amount of resorcin monoacetate, scrubbed in with a brush once daily for several days until a secondary chemical dermatitis is caused, then followed by a bland ointment for a few days and the cycle repeated cures the cases readily. Hot solutions of lime and sulphur scrubbed in (not dipping) constitutes an equally effective treatment and the cure takes less time. Rotenone has not proved particularly more valuable than lime and sulphur solution in my hands. One's training in chemistry and pharmacology does not take kindly to the use of a drug which is largely precipitated and rendered inert as is rotenone in a solution of acetone and water. Even in a solution of acetone and alcohol the rotenone will precipitate partially on standing, but it is preferable to the aqueus solution which does not especially appeal to the intelligence of the veterinarian. The expense of rotenone is a disadvantage also.

PRECISION in diagnosis necessarily leads to accuracy in identification. I believe that half of the veterinarian's fee is lost by employing such terms as gastritis, indigestion, ulcers of the stomach, ptomaine poisoning, bronchial asthma, lumbago, mange and distemper. These terms must, sooner or later, be discarded for they run the gamut from non-existent conditions to ambiguity. Gastritis is ambiguous. Professional minds interpret it to mean an inflammation of the stomach wall, a condition as rare as the days in June. To the lay mind it means an accumulation of gas. Bronchial asthma is practically unknown in the dog, the nearest approach being emphysema invariably with heart lesion. One would be safe in offering a substantial prize for every ulcer of the stomach in the dog. Ptomaine poisoning is rare if not unknown, whereas food poisoning from rich, concentrated meat and cereal foods is rather common. Lumbago is not a disease but a symptom.

About the most flagrant example of ambiguity in our nomenclature is the use of the term mange in describing skin disease. We are subject to ridicule every time we use it, just as a physician would be if he should describe the various skin lesions in the human as itch. We may mean well when we describe follicular mange as red mange when we should use the term acariasis, acarus or demodectic mange, any of which identifies this skin disease with its parasitic cause. It is not conducive to any great respect from

the layman or professional man when we use the term mange, which may mean acariasis or chronic dermatitis induced by fleas, ringworm or scabies.

PERHAPS there is no term more abused than distemper. If a dog sneezes or has a discharge from the eyes or has a fever, it appears that the word distemper is always hanging around waiting to be applied. It has come to mean most anything. Thus, dogs will present a picture of sneezing, coughing, conjunctivitis, diarrhea and dysentery accompanied by fever from an infestation of hookworm, whipworm, spirochetes and coccidia. Perhaps there is no other syndrome more closely similar to distemper than coccidiosis in puppies, where they sneeze, cough, often times having muco-purulent discharges from the eyes and nose, an elevated temperature, diarrhea and dysentery, and finally develop convulsions and die. Such an outbreak among the dogs of a sophisticated kennel owner offers a real problem in diagnosis. Fortunately the microscope is a lifesaver or at least a reputation saver in such cases.

Eliminating every pitfall we yet find ourselves often times in a quandary as to the diagnosis. This is due almost entirely to the ambiguity of the word distemper. What is distemper? When a group of diseases embracing almost anything in our bacteriologies continues to be called by that name, no wonder we become mystified. Call it enteric fever, canine typhus, salmonella infection, streptococcic infection, track influenza, track distemper, call it what you may, but do not make up your mind too soon that it is true virus distemper.

What is to be done? Are we fighting one disease or a collection of diseases masquerading under the same name? An increasing number of highly scientific veterinarians, especially in the small animal field are developing, who attract their clients, not only locally, but from all parts of the United States. They are setting a standard which all, sooner or later, must follow. This ever increasing group will take the cream of our cases if we do not improve on our methods.

UNFORTUNATELY an ante mortem diagnosis of true virus distemper and pseudo-bacterial distemper is not simple. We have a method, however, which is being adopted, more and more, by progressive veterinarians throughout the country. In a given locality or a given kennel, daily blood counts are taken which determine conclusively whether one is dealing with the virus disease (true distemper) or solely with bacterial infection. Leucopenia indicates the presence of a true virus; leucocytosis or hyper-leucocytosis indicates a bacterial infection. Taking the whole blood picture into consideration, a definite conclusion can be reached. One might expect that any dog suffering from distemper would reveal a leucocytosis upon blood examination instead of a leucopenia. Such is not the case. In the inception of true distemper, leucopenia is so pronounced that any reasonable doubt is removed. Choosing inceptive cases, during the first few days of illness in an outbreak will almost preclude error in diagnosis.

Artificial Illumination in Veterinary Practice

Various electrical diagnostic lights have been constructed to aid in the diagnosis and treatment of many pathological conditions; but they have usually been of a complex mechanism, limiting their practicability to the clinic or hospital. The high cost and necessary electrical installations made them impractical for the average practitioner. With these facts in mind a flashlight attachment, light in weight, small in size, and operating on a flashlight battery, was devised. It is inexpensive and applicable to field conditions.

Some of the conditions in which artificial illumination is advantageous are:

1. *Alveolar Periostitis.*—Many different clinical symptoms may be manifest in alveolar periostitis, such as, nasal discharge usually unilateral; swelling and osteitis of one side of the face; impaired mastication, and separation of the gum from the diseased tooth. The opening into the infundibulum

may be very small and difficult to locate by palpation. This important symptom may be seen readily by artificial illumination. It is a distinct aid in locating diseased teeth.

2. *Physical Examination of the Mouth, Ears, Eyes, and Nose.*—This is made much simpler and more accurate when artificial illumination is employed. Many otherwise obscure conditions, such as otitis media in its early stages, foreign bodies in the cheeks and tongue may be diagnosed readily by its aid, and sometimes as easily overlooked without it.

3. *Diseases of the Genital Tract.*—With a vaginal speculum and a light, cervicitis, vaginitis and other pathological developments in the genital tract may be detected readily. Such a procedure largely eliminates the use of cervical forceps. When their use is indicated, the light assists in locating the correct site for attachment of the forceps.

4. *Treatment of Calf Diphtheria.*—A light is beneficial as it is very easy to injure the healthy tissues while curretting the diseased, if some good means of illumination is not employed.

The use of such an instrument creates a favorable impression upon the owner of the patient, who, under the circumstances, is usually satisfied that the veterinarian knows the exact nature and location of the condition he is treating.

The flashlight attachment is made by removing from an ordinary flashlight the lens, bulb, and reflector. A socket, having wires attached to it, is screwed into the socket of the flashlight. These wires are passed through a piece of tubing, 16 inches long and having a diameter of one-quarter inch. The tubing is attached to the upper part of the flashlight by means of a tapered cap and extended one and one-half inches, then it is bent at a right angle, which prevents the flashlight from entering the field of vision. The other end of the tubing is threaded for holding a socket in which the bulb is placed. In this manner a very satisfactory attachment can be made, and applied to any flashlight by removing the lens, bulb, and reflector.

Artificial illuminator, made from an ordinary flash light, showing the light bulb, the extension tube, the attachment to the bulb socket, the reflector (not used), the batteries and the switch.

The illustration shows a cross-section through the artificial illuminator.

R. F. Miller,

Wayland, Iowa.

Acanthosis Nigricans

Acanthosis nigricans is a disease usually occurring in young animals. It has also been referred to as keratosis nigricans and papillary and pigmented dystrophia. The cause of the condition is unknown. The abnormality is characterized by a symmetrical bilateral hypertrophy of the papillary bodies, an increase in the pigment of both layers of the epidermis, and a hard, firm and moderately thickened skin. The places of predelection are the axilla, fold of the stifle, extensor side of toes, under surface of mouth and the region of the anus and scrotum. The hair falls out of the affected areas. The skin, at first softer than normal, gradually becomes thickened and hard, with more plainly prominent skin grooves, which somewhat resemble sealskin leather. There is a simultaneous appearance of bluish to black-brown pigmentation, elevations appear and the skin is criss-crossed with ridges and folds, but there is very little exfoliation. In some instances the disease may involve the claws and mucous membranes; the latter exhibiting soft, red, but not bloody, granulations.

Acanthosis nigricans affects man also. The lesions are quite similar to those in the dog, but are more extensive. The

condition is of interest because of the cancerous cachexia which develops, following this condition in the majority of instances, as a carcinomatous disease of the abdominal organs. The stomach is the organ usually affected, but the uterus may be affected; and in extreme cases the infection may be general, even leading to carcinoma of the mammae.

A two-year-old Scottish terrier female

Acanthosis Nigricans

came into the veterinary clinic of the Kansas State College, January 9, 1935, with a history of an abnormal condition of the skin since April, 1934. The owner stated that the condition came on rather slowly; darkening of the skin and loss of hair on the area around the head and neck being the first symptom, later spreading to the abdomen and inner surfaces of the thighs. Although the dog's appetite was normal, she was somewhat depressed.

The condition had to be differentiated from follicular mange on account of the pigmentation. A skin scraping was taken, but no demodex mite could be demonstrated. Also in follicular mange there is no symmetrical localization and the pigment may be removed with the epidermis.

The condition was characterized by a symmetrical bilateral hypertrophy of the papillary bodies and an increase in the pigmentation of the epidermis, which was bluish-black in color. The skin was hard, firm, and rough with criss-cross ridges or folds. The hair had fallen out over the affected areas, but there was only slight exfoliation and a very little pruritus. The dog showed no discomfort.

The following preparation was used to soften the skin:

R

Acidi salicylic ..... gr. xiiss
Glycerini ..... gr. xiiss
Alcoholis ..... q.s. 250cc
M. et ft. solutio.
Sig. Apply daily to affected area.

This solution was applied for three consecutive days and followed by an application of chaulmoogra oil to remove the loose epidermis. After this treatment, the dog was given one grain of thyroid extract morning and evening.

The dog was making rapid improvement when released from the hospital, and the owner was advised to continue the above treatment.

This case is of special importance in that it must be differentiated from follicular mange, chronic eczema, and pruritus.

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H. H. Fechner,
Stanton, Nebr.

Porcupine Quills

The porcupine, a family of rodents found in both the old and new world, are slow, stupid animals with a peculiar shuffling gait that is extremely deliberate. Their bodies are covered with long, barbed spines which are used as a means of defense by these harmless looking animals.

If attacked, the porcupine stops, puts its head between his paws and arches his back until the quills stand out like so many long spikes. Contrary to general belief, the porcupine does not shoot his quills, but he does probably loosen them, for if they are given the slightest touch they enter the flesh of their foe, where the numerous barbs work them in farther and farther with each movement of the muscles. Many a hunting dog, because he was too curious about the queer-looking, prickly balls, has come away with his nose full of stinging quills. The porcupine, when bothered, flips its tail, which is covered with quills, at his foe.

Many a veterinarian has been at a loss to know just the proper technique for removing the quills without difficulty and with the least pain to the patient.

General anesthesia with Nembutal, one grain per five pounds body weight, has given very good results. Forceps are used for withdrawing the quills. In case any quills should break off in the process of pulling them out, an incision should be made over the quill and the remaining portion removed.

The tongue and cheeks are common places for the quills to be found and a very thorough examination of this region should be made to make certain no quills or portion of quills are overlooked.

The formation of fistulous tracts is very common because of the barbs on the quills which cause them to move into the body. A quill has been known to enter at the shoulder and work to the posterior of the animal. The formation of abscesses is not uncommon when a portion of the quill is left in the animal. Such abscesses should be opened and drained. On two known occasions, pneumonia and tracheitis of wild cats was due to quills working into the trachea.

If treated promptly, the victim usually recovers in 12 to 24 hours after the quills are removed, due to the rich blood supply of the head and face. Animals should be watched closely in regions inhabited by porcupines. Even after one disastrous experience, they are still apt to be curious about these queer rodents.

A. E. White, Jr.,
Manhattan, Kans.

* * * *

Actinomycosis

Actinomycosis, known as as lumpy jaw, big jaw and wooden tongue is a chronic infectious disease, characterized by the formation of peculiar tumors in various regions of the body, more particularly in the region of the head and throat. It is due to a specific fungus (actinomyces). This fungus occurs in the tissues in the form of rosettes, and has, therefore, been termed the "ray fungus." The disease is not transmitted directly from one animal to another, but by contaminated feed. The ray fungus is supposed to exist in nature on the awns of barley, the spears of oats and on other grains and grasses. From these it is inoculated into the tissues of the mouth, through wounds, decayed teeth, during the shedding of milk teeth, etc.

The tumors and abscesses, wherever they may be, are all found to be of the same origin by the presence of the actinomyces. When the tumors are incised, close examination will reveal the presence of minute grains which vary from pale-yellow to sulphur-yellow in color. They occur in the soft parts of the tumor or in the pus of the abscess. These cause sufficient irritation to set up proliferative inflammatory growths, which increase as the fungi continue to multiply, until they reach enormous dimensions if the affected animal lives long enough. Wherever the disease occurs, its nature is about the same.

The consistency of the tumors varies in different situations, according to the quantity of fibrous or connective tissue present. When very little connective tissue is present, the tumors are soft; but as the connective tissue increases, the tumors become firmer and more honey-combed.

In cattle, the disease process may be located both externally or internally. Common locations are the bones of the lower and upper jaws, the parotid salivary gland and in the region of the throat. It may also appear under the skin in different parts of the body. Internally, it may involve the tongue or appear inside the mouth, pharynx, or larynx. In some instances the ray fungus may invade the lungs and cause extensive disease of those organs.

When the disease attacks the soft parts of the head, a firm swelling appears, in which one or more smaller projecting tumors exist. These push their way outward and finally break through the skin as small, reddish, fungus-like bodies covered with thin sloughs. The original swelling may become an abscess, instead of enlarging as previously described. This abscess will finally burst and discharge creamy pus. The abscess cavity thus formed does not disappear, but is soon filled with a fungus-like growth. Tumors may appear in the pharynx, breaking through from some gland where the disease first appeared. A massive tumor in this location interferes with swallowing and breathing, and serious symptoms develop.

The invasion of the bones of the jaws by actinomycosis must be regarded as one of the most serious forms of the disease. It may start in the marrow of the bones and by a slow extension, gradually undermine the entire thickness of the bone. After breaking through the bone, it continues its way through the tissues and breaking out externally into a stinking, fungoid growth. The growth may, at the same time, work inward and discharge inside the mouth.

Treatment.—When the tumors are external and attached to soft tissue, early removal may lead to recovery. After they are dissected out, one should pack the remaining cavity with gauze saturated in tincture of iodine. If the disease affects the bone of the jaw, it is serious. The diseased bone should be curetted thoroughly and packed as in the first case. After 24 to 48 hours, remove the pack and treat as an open wound. If the infection is not all removed, one may notice, at the time of healing, a gradual return of the swelling, in which case it is advisable to inject 5cc to 20cc of Lugol's solution directly into the swollen part. This treatment causes marked swelling, which gradually subsides until the growth ceases. Potassium iodide administered per os in daily doses of from 1½ to 2½ drams is a specific for the disease in many cases. If treatment is followed by symptoms of iodism, one should suspend the treatment for one week. The symptoms of iodism are loss of appetite, lachrymation, nasal discharge and marked dandruff. The cure requires from three to six weeks. Some animals, generally the ones which show no signs of iodism, do not improve. The internal administration of iodine is of doubtful value in extensive involvement of the bone or in diffuse affection of the soft parts.

Early diagnosis and treatment is important. The nature of the disease is about the same wherever it occurs. When it involves the bones of the jaw or facial sinuses, there is no cure; the iodine treatment will usually check the growth and prolong the life of the animal.

F. D. C. Markham,
Portleydon, N. Y.

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It is the belief of Turner of the Missouri Station that ovarian hormones which stimulate the development of the udder and secretion of milk may eventually be used to stimulate milk production in cows deficient in this quality.

"BARE STRIP" CONTROL OF KIDNEY WORM

A method of pasturing young pigs which will help to prevent losses from the destructive kidney worms in the Southern States has been developed by veterinarians of the U. S. Department of Agriculture. The method is described in Leaflet 108-L. It consists principally in preventing young pigs from becoming infected with kidney worms while they are with the sows. The plan provides for keeping vegetation cleared from a strip of the pasture about five feet wide along fence lines and off a larger area around the feeders and shelter houses. Under this system, most of the eggs of kidney worms passed in urine fall on bare ground. Exposure to direct sunlight on the unshaded soil destroys the vitality of such eggs before they can hatch, thus leaving the pasture free of infection.

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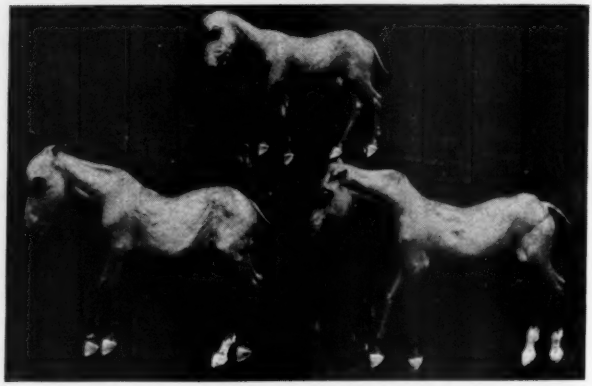
Kansas Mare Foals Triplets

Several examples of exalted fecundity in unipara have been reported in the past year, particularly from Ontario, as we well know. This report is of the birth of triplets in a mare.

January 11, 1935, J. C. Luckeroth, Seneca, Kansas, was called to Riverside Stock Farm to examine a seven-year-old, black Percheron mare, Rosette No. 197,668, weighing about 1900 pounds. She had been bred to a two-year-old Percheron stallion, Cavilier No. 207,404. This mare had foaled twice previously, at four and at five years of age. Both foals were females; carried full term and both lived to maturity. The periods of estrum were normal following the second foaling; breeding was attempted once but the mare failed to conceive. The following spring the periods of estrum were normal and conception resulted from a single service.

Signs of foaling had been evident a week previous to the call on January 11, when triplets were foaled, prematurely; having been carried but 240 days.



Triplet Foals

The triplets were presented within the fetal membranes. The illustration shows them suspended by nails on the side of a building. Due to the presence of fetal fluids, they appear slick and free of hair. The hair, which is very short, is evidenced mainly around the nostrils and on the legs, as shown by the white hair on the feet.

The large two foals were males, weighing about 55 pounds each; the smallest, a female, weighing about 35 pounds. All were developed to about the same degree. The amnionic and chorionic sacs were separate for each foal. All foals were dead when the mare was examined.

Twinning in the equine species is not uncommon, but we have seen no report of triplets heretofore in this country.

Von Oettinger,[1] Germany, estimates twin conception at 0.18 to 0.23 per cent, and triplets at 1 in 300,000, for cross-bred mares.

L. R. Wempe,

Seneca, Kans.

[1]Williams, W. L. Veterinary Obstetrics, 2nd Edition, p. 141.

Drugs Used in Veterinary Medicine

By VICTOR LEWITUS, Ph.G., B.S., M.A.,
Columbia University, College of Pharmacy

VIII. EUCALYPTUS — the Source of Eucalyptol

History.—Eucalyptus or blue gum leaves are rather a recent addition to our materia medica. There is no accurate record of its early use, but it is known that various species of the plant have long been used by the natives of Australia as a remedy for intermittent fever, and this use has survived even to this day. The drug first became conspicuous through reports of its virtues brought back by the crew of a sailing vessel, who had almost been decimated by the raging fever. They attributed their recovery entirely to an infusion that they had prepared from the leaves. It was not until the middle of the nineteenth century that the drug and its extractives was introduced into European medicine. Doctor Ramel of Valencia has been given credit for bringing this useful drug to the attention of the world in 1866. The crude material and its distillate spread quickly in popularity and use, appearing in each edition of the U. S. P. since the year 1880. The trees have been called fever trees in their native habitats where a widespread superstition exists that these plants render the atmosphere of miasmatic districts inocuous wherever they are encouraged to grow. However, this erroneous idea finds a basis from the fact that where the trees are cultivated, the drainage of the soil is greatly improved due to the large-scale evaporation that takes place by way of the leaves. Thus there is less opportunity for the malarial mosquito and other pathogenic organisms to survive and breed and the general sanitary conditions of the region are improved. However, contrary to the belief of the natives, there is no special "emanation"—to which the virtues of these trees may be attributed.

Source. — Crude eucalyptus is found in the form of leaves which come from rather large trees, chiefly the *Eucalyptus globulus,* indigenous to Australia and Tasmania, but they are also cultivated in southern Europe, Algeria and California. The young trees produce leaves of varied shapes which are deficient in the active constituents. The older trees bear several types of leaves, but the official leaves come from the older portions of the plant. The leaves used in medicine consist of lance-shaped or scythe-shaped structures, thick and leathery in texture, measuring up to eleven inches in length and about two inches in width. The color varies from a grayish to yellowish green, and over the surface are scattered many small pellucid punctate dots. It is in these dots that the active volatile substances are located.

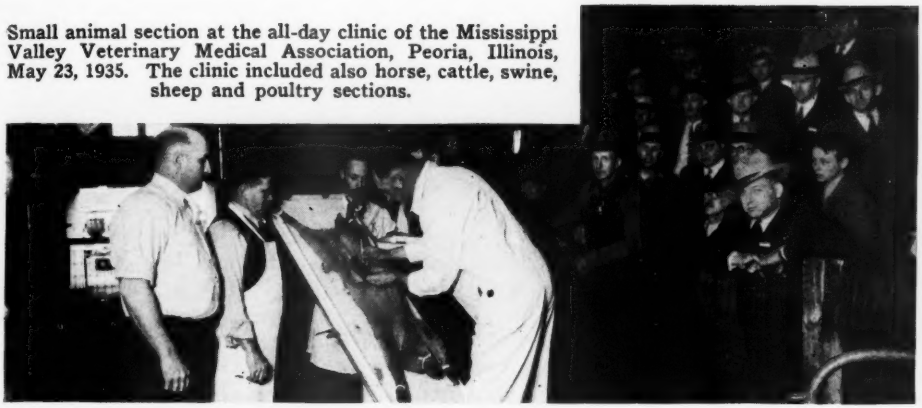
Properties. — When freshly bruised or crushed, the leaves give off a strong camphoraceous odor and have an aromatic, pungent, slightly bitter taste. The chief constituents are a volatile oil (approximately 6 per cent), tannic acid, and resin. The most important constituent in the leaves is the volatile oil which contains from sixty to seventy per cent of pure eucalyptol, $C_{10}H_{18}O$. This principle is identical with cineol. The oils vary somewhat with their source, but the most highly prized is the one that contains much of the cineol and but little of another constituent called phellandrene. The volatile oil is obtained by distilling the freshly collected leaves. It consists of a colorless or pale yollow liquid, having a characteristic odor and a spicy cooling taste somewhat like the leaves themselves. This oil is soluble in alcohol, and contains eucalyptol, cymene, eucalyptene, and tannic acid. The eucalyptol is also known as cineol as has been stated, and is obtained from the oil of eucalyptus by distillation after which it is purified by redistillation from caustic potash. It consists of a colorless liquid, having no optical activity, with a characteristic odor even stronger than that of the oil, and a spicy, pungent taste. It is slightly soluble

in water but mixes readily with alcohol, chloroform, ether and fixed and volatile oils. This constituent is also found in other species of eucalyptus trees, as well as in oil of cajaput and the oil found in *Artemisia cina.*

Preparations.—Besides the oil of eucalyptus and eucalyptol, there is an official fluid extract recognized. Furthermore, there is a eucalyptus gum, known as red gum, which comes from *Eucalyptus rostrata* and other related species of the plant which grow in Australia. This gum is recognized in the National Formulary and British Pharmacopia being the gummy exudation which is allowed to dry. Because of its high (47 per cent) tannic acid content, it is largely employed as an astringent, and is also the basis for making lozenges and troches where astringency is sought. Other preparations of the gum include the syrup, compound syrup and tincture.

Action.—The action of eucalyptus leaves is due to its volatile oil, and this in turn owes its activity to its content of eucalyptol. Externally, the action is that of an active disinfectant considered by some to be far more efficient than phenol. The oil is also an active counter irritant being rubefacient, but less so than oil of turpentine, because of a slight local anesthesia that follows its application. When it is not allowed to evaporate from the skin soon after medication, it will usually produce vesication and even pustules. Internally, the oil or its active principle produces a stimulant effect on the mucous membranes by its mild irritation. It excites salivary and gastro-intestinal secretion when given in moderate doses but larger amounts may cause indigestion nausea, vomiting and diarrhea accompanied by severe cramps. It has a carminative, antiseptic and anodyne effect when properly used in the intestine. When used even in small doses, the oil stimulates the heart and thus increases blood pressure probably by its reflex effects from the digestive tract. If the dose is increased, an opposite effect on the heart often follows. There is an effect on the cellular elements of the blood, especially the leucocytes which are inhibited in their activity to contribute to pus formation. Although it cannot be said to reach the proficiency of quinine in affecting the malarial parasite, nevertheless it is a good antiperiodic and antipyretic in these cases. Small amounts accelerate the respiratory functions of the animal slightly but large amounts directly depress the centers of respiration in the medulla. On the nervous system, there is a transient mental stimulation, but as will be seen under the toxic effects there is a marked depression that follows this preliminary effect when dosage is increased. The drug is absorbed from the skin, respiratory mucous membrane and alimentary tract quite readily. It is excreted through the skin, the kidneys, and mucous membranes of the bronchial tubes, bowels, etc., and thus stimulates these parts on being eliminated from the system. It therefore has some effect as an expectorant, carminative, diuretic, and diaphoretic.

Therapeutics.—Eucalyptol has been found to be more useful than the oil itself. It is administered in the form of emulsion, in alcoholic solutions, as a spray and in capsules. It has a fine place as an antiseptic in minor surgery and as a dressing for wounds, chronic or indolent ulcers, sores, and as a disinfectant for instruments lubricated with vaseline previous to use in the body cavities. For this purpose weak alcoholic solutions or the 20 per cent N. F. Petroxolin may be employed. The oil has been useful as a mild counter irritant in cases of affected joints, skin, hair and deeper chest conditions. The oil or its active ingredient is largely used at present as an antiseptic stimulant and deodorant inhalation for catarrhal conditions of the respiratory tract which are accompanied by putrid and fetid discharges. Recently, a special "inhalation chamber" for animals has been provided in which the vaporizer for the volatile oil has a device which heats the mobile substance slowly and the animal is thus forced to inhale the medicament without any trouble whatever. Sometimes a spray of 8 per cent of eucalyptol in liquid petrolatum is used for nasal and mouth conditions. An ointment of one part of the oil to eight of petrolatum is good for external purposes. An efficient anodyne or stimulant liniment consists of one part of



Small animal section at the all-day clinic of the Mississippi Valley Veterinary Medical Association, Peoria, Illinois, May 23, 1935. The clinic included also horse, cattle, swine, sheep and poultry sections.

eucalyptol to five of sweet oil. Because it exerts its influence on being eliminated from the body through the mucous membranes, the drug is used internally as a valuable stimulant and disinfectant especially when there is disease of the respiratory tract such as chronic bronchitis or catarrh and asthma. For similar reasons, it is known to be effective in cases of chronic cystitis and chronic pyelitis. The drug has been recommended by some in cases of canine distemper and septicemia, but its value here has not been established. It gives surprising results in pneumonia and pulmonary gangrene. A recent use of the oil, compounded with other aromatics and antiseptics, is in cases of retained placenta or prolapsed uterus. It is used to irrigate the uterus in these cases.

DOSE TABLE

		Apothecary	*Metric*
Fluid Extract of Eucalyptus:			
	H	℥ ii-iii	60.-90.
	C	℥ ii-iv	60.-120.
	S	℥ ii-vi	8.-24.
	D	℥ ss-ii	2.-8.
Oil of Eucalyptus:			
	H	℥ ii-iv	8.-15.
	C	℥ ii-vi	8.-24.
	S	m xx-L	1.3-3.3
	D	m v-xx	.3-1.
Eucalyptol:			
	H	℥ i-iii	4.-12.
	C	℥ ii-iv	8.-15.
	S	m xv-XL	1.-2.6.
	D	m v-xv	.3-1.

Toxicology.—When oil of eucalyptus or eucalyptol causes toxic effects it is because they possess the power of a strong volatile oil. Locally, as has been stated, the preparations if used too often in too concentrated form or when tightly bandaged will cause the formation of blisters or pustules. This can be avoided by care in proper dilution of a preparation. Internally, large doses cause eructation, nausea and vomiting, diarrhea accompanied by signs of great pain. There is a fall of blood pressure due to a depressed heart action, and there may be muscular weakness and lowered temperature. The animal staggers and falls, having lost sensation in the limbs. The breathing is slow and irregular, respiration especially being embarrassed in this type of poisoning. This is due to direct effects on the centers of respiration. Breathing stops long before cardiac failure in fatal cases. There is a marked depression on the central nervous system, the brain, medulla, spinal cord being all involved and reflexes being for the most part abolished. Occasionally, there are convulsions before the fatal end. On autopsy, there is usually large amounts of blood in the pleural cavity, the lungs are collapsed and bloodless, and the right portion of the heart contains frothy blood. This type of poisoning calls for prompt treatment in which cardiac and respiratory stimulants are mainly indicated, with some consideration given to local sedative medication.

Abstracts

Cuboni Pregnancy Test for Mares

Urine samples of 69 non-pregnant mares, 41 geldings, and 43 pregnant mares were subjected to a chemical analysis[86] as follows: The urine is filtered through filter paper. To 5cc of the filtered urine are added 1cc of sulfuric acid. The mixture is heated in the waterbath for ten minutes; then the sample is quickly cooled by immersing the tube in running cold water. Next, 6cc of benzol is added and the tube is shaken with about 50 strokes. The urine sample is then allowed to sediment and the supernatant benzol is decanted and 1cc of concentrated sulfuric acid added; the tube is put in a waterbath and heated to 70-90°C for about one minute, afterward the tube is gently agitated and then left standing for more than five minutes. The intensely reddish-brown stained sulfuric acid will collect beneath the benzol layer. The test is considered positive when a greenish fluorescence is visible in direct light. However, when the color remains reddish-brown in direct as well as in indirect light, the reaction is called negative. The test can be carried out regardless of whether the urine is fresh or not.

Treatment of Nymphomania in Mares

The spaying of mares is of practical importance,[87] because 60 to 70 per cent of nymphomanic mares can be made serviceable again. The dorsal vaginal wall is selected by Richter for the place of perforation, which is accomplished with pointed scissors. The ovaries are severed with a specially constructed ovariotome, an instrument 90cm long, resembling an ecraseur-emasculator. Of 66 mares spayed in this manner, 11 per cent died; two from loss of blood, one from a rectal wound infection and four from colic. Generally, in younger mares the prognosis is more favorable than in older animals. The prospects for success are greater when the symptoms leading to the operation are caused by pathological changes in the ovaries. The outcome of the operation cannot be foretold definitely until about four weeks after the spaying.

Diagnosis of Pregnanacy in the Mare

The Friedman-Schneider[85] technique of the pregnance test in mares consists of the intravenous injection of 5 to 15cc of blood serum of the mare to be examined, into rabbits. A laporatomy is made any time between second and fourth day after injection, and the diagnosis is read. This method has been found to be a very reliable means of diagnosing pregnance in mares.

Technique of Spaying Mares

When spaying mares, special emphasis is to be placed on preoperative arrangements, such as preparation of the mare for the operation, position of the mare for the operation, and proper care of the field of operation. Nine mares[88] spayed by a ventrovaginal incision recovered without any complications. The authors consider this method suitable for the practitioner.

Chronic Nephritis in Cattle

Chronic embolic nephritis[89] is caused by an acute embolic nephritis. The kidneys are enlarged, discolored and studded with infarcts. The condition may affect one or more reniculi. When the formation of connective tissue becomes excessive, the kidneys will become indurated and will shrink in volume. Calcium deposits may occur also. In almost all cases a slight albuminuria can be diagnosed clinically. Strictures and nodules may be felt on rectal exploration. If the kidney swelling is diffuse or if shrinking has taken place, the condition can then

[86]Cuboni, E. 1934. Ready test for pregnancy in mares (translated title). *La Clin. Vet.* 57(2):85-93 (abstr. W. T. M. 22:19).

[87]Richter, J. 1934. Die Kastration der Stute und ihre Erfolgsaussichten. (The spaying of mares and its chances of success). *Berl. Tierarztl. Wochenschr.* 47(47):769-771.

[85]Grini, O. 1935. Die Trachtigheits diagnose bei der Stute nach der Methode Friedman Schneider. (The Friedman-Schneider pregnance test in mares.) *Arch. Tierheilk.* 68(6):397-402.

[88]Holle, A. and Holle, J. 1934. Erfahrungen bei der Stutenkastration nach der Methode der ventralen Scheidenschnittes. (Spaying of mares by means of ventrovaginal incision). *Deutsch Tierarztl. Wochnschr.* 42(49): 784-786.

[89]Wester, J. 1935. Chronic Nephritis in Cattle (Transl. title); *Tijdschr. vs. Diergeneesk,* 62:2, pp. 62-67.

not be differentiated from the chronic glomerulo-nephritis. The prognosis is unfavorable. A diffuse bilateral nephritis may lead to fatal uremia. Medication is without avail.

Chronic glomerulo-nephritis is a disease quite typical of the bovine race. The primary causes are bacterial toxines. Abscesses are found simultaneously in other organs. As a rule, both kidneys are affected at the same time. They are enlarged, indurated and heavier than normally (maximum weight abscessed, 3250gm.). The kidneys are yellow or yellowish grey in color. When the cattle had been on pasture, the color is sometimes an intense yellow. The surface is granulated and studded with small cysts. On histological examination the glomeruli are found to be enlarged and swollen, irregular in shape, and exhibiting cellular infiltration. The interstitial tissue shows irregular inflammatory processes. Sometimes the kidneys do not show lesions macroscopically, and the diagnosis can be made only histologically. Symptoms are usually absent, or consist solely of a slight albuminuria. In a later stage, disturbances of growth and nutrition, and sometimes an ill-smelling diarrhea will occur. Temperature and respiration are normal, the pulse is firm. The specific gravity of the urine is usually low, but, at times, may be normal. There is little sediment. Secondary processes are heart failure and a very slight edema which is not noticed except on slaughtering. When the nephritis is of long standing, uremic enteritis may flare up suddenly. The illness is a very lingering one. Treatment is useless.

In chronic indurative nephritis, both kidneys are small, firm, and shrunken. On cross section much connective tissue is visible in the cortical substance. The condition is primarily an interstitial nephritis. It starts with a cellular infiltration and an edema in the neighborhood of the small vessels, especially in the cortical substance. The resulting pressure causes atrophy and cyst-formation in the tubules. The kidneys appear pale and exhibit many strictures. On rectal exploration the left kidney may be found to be somewhat smaller in size. The urine is light colored; the specific gravity is mostly low; traces of albumen, and cellular elements may be found; the reaction is acid. The clinical symptoms consist of emaciation and diarrhea. Heart lesions may be present sometimes. The urea content of the blood serum is high during the terminal stages. After long duration of the nephritis, premortal uremia symptoms will appear.

Secondary chronic embolic nephritis is found to affect usually but one kidney. At times, the condition may affect merely individual reniculi. The primary cause may be a pyelonephritis, embolic nephritis, calculi in the kidneys or the ureters. The urine may contain traces of albumen, but is found normal in most cases.

Kidney tuberculosis can be diagnosed clinically by the finding of acid fast bacteria in the urine. Changes in the urine are very slight and indistinctive. In miliary tuberculosis acid fast bacteria may not be demonstrable in the urine. On rectal exploration the tubercular nodules in the kidneys may be felt sometimes.

Pyelonephritis in cows starts usually with an inflammation of the vagina, the ureter and the bladder. It is a sequel to a trauma received at the time of parturition. The bacteria responsible for the inflammation of the bladder migrate along the lymph and blood vessels into the pelvis of the kidneys. Small subepithelial abscesses are formed in the walls of the calices. They break through into the lumen of the kidney pelvis, and spread out along the papillae where they will cause necrosis. From there they will reach the medullary substance by way of the vessels. There can be no doubt about the etiological relationship of the *Bacillus bovis venalis,* although other bacteria may be present occasionally. There is reason to believe that the infection is spread by the blood stream. The urine has an ammonia odor, is bloody and flocculated. Characteristic for the course of the disease are colicky symptoms, indicative of urinary stasis and obliteration of a ureter. The experienced practitioner is able to diagnose this condition without urine analysis, simply by a rectal exploration. The finding of bacteria alone is not sufficient proof that the kidneys are

really involved; on the other hand, a slight form of pyelonephritis may exist without the presence of bacteria. The course of the disease may last for months or the process may become arrested spontaneously. The best advice is emergency slaughter.

Pyelonephritis in the bull is exceedingly rare. The primary cause is a pyemic infection in other organs, though, an ascending infection from the prepuce is possible.

* * * *

Newly Discovered Functions of the Spleen

Prosplen is the name of a recently discovered substance in the spleen.[95] Prosplen regulates the acid secretion of the stomach; it influences also the water exchange between blood and tissue. When injected into the blood circulation, prosplen will raise or lower the sugar and chloride content, depending on the amount injected. One of the most important functions of the spleen is the defense against invading microorganisms. The injection of prosplen increases the phagocytic activity of the leucocytes about 50 to 60 per cent. Substances in the spleen are also responsible for the formation of anti-bodies.

* * * *

Technique in Spaying Sows

In order to put spaying of sows on an economical basis,[90] it is recommended to organize the work so that a large number of sows may be spayed on the same trip. It is expedient to mail to the farmers printed instructions previous to the call. Two helpers are to be employed to restrain the sows and to prepare the field of operation. For restraining, chains are preferred to ropes. The sow is tied either to a board or a ladder. Narcosis is not used because present day methods are unsafe. The skin incision is made just large enough to allow two fingers to enter the abdominal cavity; the muscle and peritoneum are severed with the index finger. The hand is now rinsed again in a disinfecting solution and the wound is slightly enlarged by tearing, to allow the hand to enter. The fingers are pushed along the dorsal wall in a curved position. Orientation is facilitated by tracing the uterus. The ovaries are taken between the index and middle finger and pulled out. The ovariectomy of sows in heat can also be done without danger, but special attention is to be paid to the prevention of hemorrhage. The suturing of the wound is performed with a combination skin-peritoneum suture. Among 7000 pigs so spayed, no resultant hernias were observed.

* * * *

Oil of Chenopodium Poisoning In Pigs

In some pigs[91] oil of chenopodium causes severe poisoning and even death. The symptoms observed, such as excitation, convulsions, trembling, manege movements, would indicate that the oil of chenopodium acts primarily upon the central nervous system. There are great variations in the vermifuge action of different brands of oil of chenopodium. Some commercial oils possess excellent vermifuge action, while others do not act at all or only on part of the worms.

* * * *

Intraperitoneal Injection of Blood

In those cases in which for technical reasons or otherwise a blood transfusion[96] by intravenous injection is not possible or advisable, Ooi and Nakamura deem it expedient to inject the blood into the abdominal cavity without hesitation. Experimenting with rabbits the authors found that the injection of citrated or defibrinated blood into the abdominal cavity is just as efficient as the intravenous injection. Wound scars in the abdominal cavity do not seem to retard resorption. The number of red blood cells increases rapidly, reaching the highest level within eight hours, after which time they slowly decrease again. When defibrinated blood is used, the increase of leucocytes is preceded by a leucopenia.

[90]Krammel. 1935. Neuere Forschungen über die Milz. (Newer knowledge concerning the function of the spleen.) *Tierarztl. Rundsch.* 41(14):229-230.

[90]Krisch, O. 1935. Erfahrungen bei der Kastration weiblicher Schweine. (Experiences from the spaying of sows.) *Weiner Tierarztl. Monatsschr.* 22(1):1-12.

[91]Vajda, Th. 1935. Vergiftung von Schweinen durch Chenopodiumsl und dessen unzuverlassige wurmtreibende Wiskung. (Oil of Chenopodium an unreliable vermifuge.) *Wien. Tierarztl. Monatsschr.* 22(5):142-145.

[96]Ooi, F. and Nakamura, T. 1933. The influence of intraperitoneal blood transfusion upon the blood picture. The *Tohoku Jour. of Exp. Med.* 21:191-210)

Treatment of Blacktongue in Dogs

When treating blacktongue,[92] special attention is to be paid to the condition of the gastro-intestinal tract. The principal treatment consists in the hourly application of magnesium perhydrol tablets (Merck). The appetite may be stimulated with small pieces of fat free, ground raw beef. In cases of pronounced debility, tea with milk and egg yolk may be given. The existing nephritis does not need to be treated. To avoid recidivation, it is expedient to continue the dietetic measures and the use of magnesium perhydrol tablets for some time beyond the date of recovery.

Canine Typhus and Weil's Disease Identical

Canine jaundice,[94] as observed in Vienna is identical with the *icterus infectiosus* (Weil's disease) of dogs. The disease is transmissible experimentally to nursing puppies and guinea pigs. Leptospira were isolated from the kidney tissues of the original dog as well, as from the artificially infected laboratory animals. Of course, the symptom complex of the so-called canine typhus can be brought about by diseases of various origin, such as true nephritis, or an obturating foreign body in the intestines, and other causes.

Canine typhus, which is known to occur in periodical epizootics is stationary in Vienna in some individual dogs. Leptospira can be found with great regularity in the kidney section and in the urine of such carrier dogs. The injection of a collective sample of kidney pulp from three dogs, affected with the classical form of canine typhus, into ten nursing puppies produced *icterus infectiosus* (Weil's disease) in nine of them. The tenth puppy succumbed to *icterus infectiosus,* but without the symptoms of jaundice. The incubation period varied between ten and twenty days.

The clinical picture, the blood picture and the post-mortem lesions of natural cases of icterus infectiosus, of natural cases of canine typhus, and the manner of artificial transmission are identical in these two diseases and in the experimentally induced disease in the nursing puppies. Therefore, the canine typhus (Stuttgart disease of dogs) must be considered identical with the icterus infectiosus (Weil's disease) of dogs. The former is merely the jaundice-free phase of the latter.

In spite of the frequency of leptospirosis in dogs in Vienna, cases of Weil's disease in humans are rather rare in that city. Leptospira infection is of frequent occurrence among the sewer rats in Vienna.

Bathing Dogs and Cats

Bathing is harmless to dogs and cats,[93] provided the bath is neither too hot nor too cold, and concentrated drugs are not used. The water should be about 28° C; the soap used should be mild. It is advisable to bathe the animals in the evening so that they need not go out doors until the next morning. Cats often fight bathing; as a result of their struggles they often appear exhausted after the bath.

Duration of Induced Glycosuria

The observation[98] was made that induced glycosuria lasted much longer than should be expected from the calculation of the blood sugar value; glycosuria, for instance, still continued, when the blood sugar level had fallen to about 0.13, far below the threshhold for the onset of sugar excretion. This phenomenon is contradictory to the popular belief of the kidney as an overflow valve. Experiments on a series of dogs revealed that the threshhold value for excretion of sugar through the kidneys averages in dogs normally 0.18 per cent of the blood sugar content. It is thought that individuality and other unknown physiological factors will probably cause variations.

[92]Pospichel, R. 1934. Zur Therapie der Stuttgarter Hundeseuche. (Therapy of canine typhus.) *Berl. Tierarztl. Wochnschr.* 50(44):725.

[94]Wirth, D. 1935. Das Stuttgarter Hundeseuchen Problem. (Canine typhus.) *Wiener Tierarztl. Monatsschr.* 22(5):129-142; (6):161-176.

[93]Wirth, D. 1935. Das Baaden von Hunden und Katzen. (Bathing dogs and cats). *Weiner Tierarztl. Monatsschr.* 22(3):79-80.

[98]Steinmetzer, K., and Goldner, S. 1935. Die Nierenschwelle fur Zucker beim Hund. (The threshhold for sugar in the kidney of dogs.) *Wien. Tierarztl. Monatsschr.* 22(10):299-302.

Blood Groups and Blood Transfusion

Preliminary to the study of blood transfusion[97] in domestic animals the author investigated the blood groups in horses and cattle. Four blood groups were found; they correspond to those in man. A small number of blood samples were found, which did not fall in any of the four groups; they were placed in subgroups. The blood of herbivores was found to possess weak hemagglutinating properties. The agglutination titer is subject to variation. Excellent results were had with blood transfusion in cases of chronic anemia, intoxication, and a number of other chronic processes.

* * * *

Chloral Narcosis In Swine

Satisfactory narcosis,[99] lasting about one hour, may be obtained by using 0.25 to 0.33gm chloral hydrate per kgm body weight, (about two grains per pound body weight) and injecting it intraperitoneally in dilutions less than 5 per cent. Concentration of 5 per cent or more cause an irritation of the peritoneum, producing a peritonitis within 24 hours. The solution is to be made fresh, and after filtration should be sterilized for ten minutes. When cooled down to body temperature it is injected midway between the navel and the border of the pelvis. The pig should have been fasted for 24 hours, to avoid injury to the intestines. The pig is allowed to run loose for a time, to facilitate quick resorption. After a few minutes exercise, motory paralysis will set in, which soon leads to complete narcosis. The method is economical, simple, and sure in its results.

* * * *

Insect and Arachnid Carriers of Pox

Pox infected mosquitoes[100] will carry the virus up to 185 days. It is always localized in the proboscis. There is no negative or non-infective period. The transmission of the pox virus is a mechanical one; there is no virus development in the mosquitoe; the latter are, therefore, merely carriers and not intermediate hosts. Fowl pox virus could also be transmitted by flies, bedbugs and ticks. Stomoxys calcitrans was able to transmit the disease for 20 days from one bite; *Cimex lectularius* for 35 days; *Argas persicus* for 30 days, and *Ornithodorus* for 97 days. The red mite (*Dermanyssus avium*) and lice of the family Philopteridae were unable to transmit fowl pox or diphtheria. The type of the transmission was usually the pox type; diphtheria occurred either as a sequel to pox, or it developed independently. The period of incubation lasted from three to twelve days; the duration of the disease lasted from three to six weeks. The mortality was low.

* * * *

Disease of the New-Born Foal

Infections[101] with streptococci and with *Shigella equuli* are considerably more important than those with *Salmonella paratyphi* and *Corynebacterium pyogenes*. Infections with *S. abortivo-equina* will usually terminate fatally within 24 hours. Mortality from Shigella infection takes place during the first four days after birth; from streptococcic infections the fatalities occur mainly from the third to the fifteenth day. Corynebacterium infections do not occur until the sixth or seventh week. Generally speaking, the diseases of colts must be considered as *intra vitam* infections, even though other causal relationships between colt and mare had been noted. The *Salmonella abortus equi* infections are always contracted intra-uterine. Combatting of these diseases depends upon hygienic and sanitary measures. Intravenous injection of 50 to 100cc of a high-valent pyosepticus serum, immediately after birth gives protection against Shigella infection. Examination of the mare's milk should reveal the presence of streptoccic infection. For the purpose of treatment, specific vaccines are to be preferred to polyvalent vaccines.

[97] Tscheredkon, W. N. 1933. Blood transfusion in domestic animals (transl. title). *Abstr. Tierarztl. Rundschau.* 41:12.

[99] Middelkoop, A. F. 1935. Intraperitoneal chloral hydrate narcosis in pigs (transl. title). *Tijdschr v. Diergeneesk.* 62(4):193-199; (5):253-262.

[100] Bos, A. 1934. Beitrag zur Kenntnis der Geflugelpockenubertragung durch Mucken and andere Arthropoden. (Fowl pox transmission by means of mosquitoes and other anthropods.) *Zeitschr. f. Tufkokh. d. Haust.* 46(3):195-260.

[101] Miessner, H., and Koser, A. 1935. Fohlenkrankheiten. (Diseases of Colts). *Deutsche. Tierarztl. Wchnschr.* 43(10):145-150.

CALCIUM GLUCONATE SOLUTION PATENTED

James A. Austin, acting for the Jensen-Salsbery Laboratories, Inc., Kansas City, has been granted a patent on a process for stabilizing calcium gluconate solutions for therapeutic use. The process consists essentially in adding boron compounds, including boric acid, the one commonly used, to a hot solution of calcium gluconate, thus rendering the latter stable at room temperatures in concentrations as high as 40 per cent.

The Federal Food and Drugs Administration recently prosecuted E. C. Bellwood, trading as Bellwood Farms, South Richmond, Virginia, for violating the Food and Drugs Act by shipping Bellwood Farms Abortion Treatment in interstate commerce. This fraudulent concoction, the government showed, is made up of corn starch with just enough potassium permanganate to make a pink solution in water. Neither the corn starch nor the permanganate cost more than a few cents a pound, yet it was sold to farmers at $6.00 to $12.00 a package (about 1½ lbs.).

Bellwood was found guilty by the jury and placed on probation by the court for a period of three years, during which time he was obligated not to violate the Food and Drugs Act. The Bellwood treatment consisted of mixing a teaspoonful of his starch and permanganate compound in a quart of water and then sprinkling two teaspoonfuls of this mixture on the animal's feet twice a week. The Bellwood Farms have been marketing their fraudulent remedy for several years, chiefly through advertisements in the live stock and dairy papers, particularly Hoard's Dairyman, the editor of which is an honorary member of the A. V. M. A.

Twenty-five members of the Inland Empire Veterinary Medical Association attended a meeting held jointly with the Junior A. V. M. A., at the Washington State College, Pullman, April 27, 1935. Subjects discussed included: City Milk Sanitation; Canned Foods; The Business of Veterinary Practice; Vomition in Dogs; Convulsions in Dogs; Encephalomyelitis in Horses; Parsnip Poisoning in Cattle, and case reports from many of those in attendance.

A banquet was held in the evening, at which the visitors included Dr. E. O. Holland, president of the Washington State College; Mr. M. M. Miller of the U. S. Department of Agriculture, and Mr. Wiley of the State Department of Health. Dean E. E. Wegner of the College of Veterinary Medicine, was the principal speaker at the banquet.

It was decided not to hold a summer meeting, but to attend a meeting of the Northwest Veterinary Association at Victoria, July 8-10. The Inland Empire Veterinary Medical Association will hold its next meeting in the fall, at Walla Walla, Washington.

KANSAS GRADUATES THREE VETERINARIANS

At the Eleventh Annual Commencement of the summer school of the Kansas State College of Agriculture and Applied Science, July 26, 1935, the degree of Doctor of Veterinary Medicine was conferred upon three candidates, as follows: John E. B. Mouw, Charles F. Prchal and Alfred E. White, Jr., all of Manhattan.

The U. S. Department of Agriculture has issued a new farmers' bulletin on anthrax, warning live stock owners against trying to diagnose the disease by opening up the carcass of an animal that is suspected of having died of anthrax; and informing them that such a practice is dangerous to the person opening the carcass and may contribute to the spread of the infection. Live stock owners are directed: "If anthrax is suspected, the cause of death should be determined by a qualified veterinary, who knows how to take the necessary precautions against infecting himself and the premises should an autopsy be needed. If anthrax is found a veterinarian is better fitted to direct procedures for controlling the outbreak." The bulletin is known as Farmers' Bulletin 1736-F.

Prof. Dr. R. Götze, Director of the Veterinary Clinic at Hanover, has been reelected president (Rektor) of the Veterinary College Hanover, for the school year 1935-36.—*Tierarztl. Rundschau* 41:252.

The Ivicene dog, a greyhound of the Balearic Islands, has been called the oldest breed of dog living.—S. N. L., 27:741.

ARSENIC AND ARECA NUT NOT DEPENDABLE IN FILARIASIS

In the August 1933 issue of VETERINARY MEDICINE, I made a preliminary report, tentative in nature, on the favorable results attained from the use of arsenic and areca nut in the treatment of filariasis in dogs. Further observations, however, have since indicated that the benefits derived from this treatment must be credited to stimulation of metabolism by the large doses of arsenic and not to any unfavorable effect upon the adult *Dirofilaria* in the heart or their larvae in the peripheral circulation. The antimony preparations now on the market, in my opinion, offer far more hope of effecting a cure, but they should be used with caution.

F. G. Steinbach.

Wildwood Crest, N. J.

PUBLIC HEALTH MEETING

The 64th annual meeting of the American Public Health Association will be held in Milwaukee, Wisconsin, October 7-10, 1935. The membership of this organization includes 4,500 public health workers, whose annual sessions review developments in health protection and promotion and outline plans and policies for future advances.

A number of related organizations will meet simultaneously and in part conjointly with the public health association. They include:

American Association of School Physicians
International Association of Dairy and Milk Inspectors
Conference of State Sanitary Engineers
International Society of Medical Officers of Health
Association of Dairy, Food and Drug Officials
Conference of Wisconsin Health Officers
Conference of State Laboratory Directors
Association of Women in Public Health

Prior to the opening of the general sessions of the American Public Health Association, the fourth Health Education Institute, sponsored by it, will be held October 4, 5, and 6. The subject under consideration this year will be "Health Education in Small Cities and Rural Communities."

As usual, a health exhibit featuring scientific, educational and commercial displays will be held in connection with the association meeting.

More than 400 papers will be presented at the general and ten sectional sessions of the public health association. These discussions include much of interest to veterinarians, many of whom attend meetings of the American Public Health Association regularly.

STALLION PULLING CONTEST

The first World's Stallion Pulling Contest, with $1500 in prize money, is announced by Wayne Dinsmore, executive secretary of the Horse and Mule Association of America. As the first of an annual series of contests, aimed to discover the finest young draft sires in the world, it will be a unique and history-making event, held on the commodious grounds of Lincoln Fields' Race Track at Crete, Illinois, 30 miles south of Chicago on the Dixie Highway, Saturday, October 12th.

"It will be the greatest pulling contest ever staged," said Mr. Dinsmore, "and prove to be the most progressive step ever taken for the improvement of work horses and mules. Experts in the horse industry are enthusiastic over the practical results which will be obvious from such an annual event. For it will be the first time in the world's history that a practical determination will be made of the best breeding sires in the draft animal world. The choice has been left to observation of externals in the past. From now on the records will be available."

The horses and mules on our American farms today number over 16½ million and are worth nearly 1 and 2/5 billion dollars. "Few people realize the importance of this, but it means more 'horse-power' to every farmer using and breeding draft stock. If we can substantially increase the pulling power of the average farm team in the next 30 years, just as automobile engineers have increased the horse-power of motors with the same amount of fuel, then the horse will be more useful and economical than ever."

FLORIDA, MISSOURI, ARKANSAS, COLORADO AND NEW MEXICO ERADICATE BOVINE TUBERCULOSIS

Florida, Missouri and Arkansas were added to the modified accredited areas July 1, 1935; and Colorado and New Mexico were added to the list of modified accredited states Aug. 6, 1935. This reflects the accelerated progress of tuberculosis eradication in recent months, since this is the first instance in which the Department of Agriculture has designated three states in one announcement. There are now 22 states recognized as modified accredited areas.

Florida is the first state on the Gulf of Mexico and the fifth on the Atlantic Seaboard to be accredited. The last cow to receive the tuberculin test in Missouri was tested by Dr. D. F. Luckey, former State veterinarian, one of the first to use the intradermic method of testing cattle for tuberculosis. This rapid and accurate test has enabled the Bureau of Animal Industry to test cattle on a large scale and at comparatively low cost to the Government. In Arkansas a feature which expedited the testing was the holding of preliminary meetings attended by cattle owners and veterinarians. At these meetings all phases of the work were discussed and places for the establishment of chutes were selected. Later each cattle owner received a notice informing him of the exact hour, date, and place for the testing of his herd.

With the progress made in the states mentioned and additional counties in other states, the total number of counties classed as modified accredited areas, are well over four-fifths of all the counties in the United States. Tuberculin testing is progressing at the rate of nearly three million cattle a month.

Dr. W. Kruger, Professor of Veterinary Anatomy at the Berlin Veterinary College, has been elected president (Rektor) of the Friedrich-Wilhelm University in Berlin, for the school year 1935-36. The delivery of the rectorial insignia to Doctor Kruger by the retiring Rektor has been made the occasion of an impressive ceremony at the University auditorium. The new Rektor spoke of the future of the National-Socialistic University.—*Tierarztl. Rundschau.* 41:236.

Dr. Robert von Ostertag contracted an infection in one foot recently while staying at the watering place of Oberschlema, where he had gone for a rest cure, previous to his planned trip to South America. His illness necessitated his removal to a hospital in Leipsic, where the foot had to be amputated. Latest information is that Doctor von Ostertag's health is good, and healing is proceeding normally. Upon complete recovery he is planning to return to Berlin.—*Deutsches Tierarztelblatt* 2:215-216.

ARMY VETERINARY SERVICE

Lt. Col. Harold E. Egan is relieved from his present assignment and duty at the Army Veterinary School, Army Medical Center, and will report to the commanding general, Hawaiian Department, for assignment to duty with the Veterinary Corps.

Lt. Col. Horace S. Eakins is assigned to duty at Fort Benning, Ga., effective upon completion of his present tour of foreign service in the Panama Canal Department and will join that station and report to the commanding general not later than August 31, 1935, for assignment to duty.

Lt. Col. Raymond A. Kelser is relieved from duty at the Boston quartermaster depot, Boston, Mass., from additional duty at headquarters First Corps Area, and as attending veterinarian with the R.O.T.C. unit, Harvard University, and at Fort Devens, Mass., in time to proceed to New York, N. Y., and sail on transport scheduled to leave that port on or about September 24, 1935, for the Panama Canal Department. Upon arrival he will report to the commanding general for assignment to duty with the Medical Department research board and to the Governor of the Panama Canal for additional duty with the research board.

Major Will C. Griffin is relieved from duty at the Army Medical Center, Washington, D. C., on or about August 29, 1935, and directed to report to the commanding general Army Medical Center, for duty for the purpose of pursuing a course of instruction at the Army Veterinary School.

Veterinary Reserve Corps

Separations—

Muldoon, Wm. Edward, Lt. Col., Peru, Ind. Died May 12, 1935.

Brown, Douglas Robert, 2nd Lt., Ennis, Texas. Died April 29, 1935.

New Acceptances—

Captain H. C. Gale, 3501 G Ave., Fort Worth, Texas.

First Lieutenants:

Anderson, Robert Jewell, Jr., R. F. D. No. 3, Marshall, Texas.

Bender, Jack Downing, 2117 W. Ashwood Ave., Nashville, Tenn.

Corbin, Allen Edgar, 2417 Deming Ave., Columbus, Ohio.

Couch, Weldon Morris, R. F. D. No. 4, Grandview, Texas.

Cox, Danford Lodge, R. D. No. 2, Willoughby, Ohio.

Dovre, Odin Esten, Minneota, Minn.

Evans, Lewis Ward, 114 W. Frambes Ave., Columbus, Ohio.

Ewing, Robert Arthur, North Jackson, Ohio.

Fisherman, Henry, 1400 Runnels St., Big Spring, Texas.

Fly, Glen Orahood, 1826 E. 11th St., Indianapolis, Ind.

Gibson, Bernard Harrison, Station B, R.F.D. No. 1, Columbus, Ohio.

Herd, Dwight, East Liberty, Ohio.

Hesse, Charles Perry, Carroll, Ohio.

Ishee, Vaughn Eugene, Middlefield, Ohio.

Johnson, Edgar Stanley, R. R. No. 1, Elwood, Ind.

Lieberman, Leo Leibsch, 276 Mill Hill Ave., Bridgeport, Conn.

Long, Elmer Ira, 202 South G. St., Wellington, Kans.

Mauney, Jacob Philo, 204 Gaston Ave., Kings Mountain, N. C.

Morrison, Geo. Alexander, 3700 2nd Ave., No., Great Falls, Mont.

Morse, Joseph Ben, 8923 Empire Ave., Cleveland, Ohio.

Muniz, Charles Manuel, Trujillo St., No. 1, Ponce, Puerto Rico.

Nicholl, Elden Carrol, 814 Prospect St., Amarillo, Texas.

Simonson, Earl Matzen, Hooper, Nebr.

Smith, Claude Argyl, Fayette, Ohio.

Spangler, Harold Monroe, Somerset, Ohio.

Thompson, William Moses, R. F. D. No. 5, Winnsboro, Texas.

Tucker, Carl Conrad, Claypool, Ind.

Warnock, Robert Simpson, 307 West 7th St., Aledo, Ill.

Whitehead, Jack Owen, Smith Point, Texas.

Abell, Guy Forbes, Rome, Ga.

Asbill, Stephen Grieve, Davis, Calif.

Badger, George Wm., Burke, N. Y.

Barsky, David, 72 Rugby Road, Buffalo, N. Y.

Benedict, Walter Lucian, 84 Grant Ave., Auburn, N. Y.

Bixby, Donald Orton, Norfolk, N. Y.

Boardman, William, Sheffield, Mass.

Brenner, Carl Frederick, Sheffield, Iowa.

Brown, Roswell Leo, 1817 Church St. Evanston, Ill.

Bruce, Ronald Hermon, R. F. D., Hudson, Mass.

Buell, Herbert James, Constable, N. Y.

Burstein, Harold, 1961 North 31st St., Philadelphia, Pa.

Cain, Harold Driscoll, Herring, N. Y.

Carll, Walter Tederoff, 65 Nichols St., Bridgeton, N. J.

Cavanaugh, Joseph Leo, Esbon, Kans.

Chastain, Ernest Frederick, Gazelle, Calif.

Daman, Arthur Henry, Veterinary Hospital, Kansas State College, Manhattan, Kans.

Daut, Wm. Frederick, Jr., 1301 Kaminken, Pullman, Wash.

Dickson, Howard Strangeway, Delhi, N. Y.

Donat, Lawrence Charles, Verdigre, Nebr.

Ebertz, Charles Dexter, Newark, N. Y.

Eggert, Wm. Emerick, Jr., 89 Washington Place, Ridgewood, N. J.

Ehrlich, David, 89 Pulaski St., Brooklyn, N. Y.

Eichhorn, Ervin Alfred, Pearl River, N. Y.

Emas, Jack Robert, 7022 Ashby Road, Upper Darby, Pa.

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Holt, Alfred Lawrence, 90 Sammis Ave., Huntington, N. Y.
Hook, Crosby Johnson, Braymer, Mo.
Hoppenstedt, Clifford Henry, Pine Bush, N. Y.
Howarth, Carl Robert, R. R. No. 2, Box 163, Littleton, Colo.
Hoyt, Kenneth Richard, 110 South 8th Ave., Yakima, Wash.
Huber, Samuel Flickinger, 297 East Commerce St., Bridgeton, N. J.
Hutt, Samuel, 164 Parkside Ave., Brooklyn, N. Y.
Jewell, Harold Jack, care Vet. Dept., Kansas State Col., Manhattan, Kans.
Johanson, Ferdinand Ossian, R. R. No. 4, Newfield, N. Y.
Johnson, Sanford Edwin, 2724 Spaulding St., Omaha, Nebr.
Karlson, Alfred Gustav, 2841 29th Ave., South, Minneapolis, Minn.
Keith, Horace Brooks, Traer, Iowa.
Kelley, Donald Clifford, 1121 Washington St., Great Bend, Kans.
Kelsall, Samuel III, 407 W. 12th St., Lawrence, Kans.
Kerr, George Miller, 8 Garfield Ave., Hyattsville, Md.
Knappenberger, Jos. Frank, Penalosa, Kans.
Kral, James, 5210 South 10th St., Omaha, Nebr.
Krukowski, Stanley Martin, Southold, Long Island, N. Y.
Libby, Leslie Raymond, Route No. 2, Sebastopol, Calif.
Lucich, Frank, 517 East 3rd St., Cle Elum, Wash.
McCreary, Andrew J., 244 Evergreen Ave., Brewton, Ala.
McFadden, Glenn Melvin, Natoma, Kans.
McMichael, Wm. Wallace, Paonia, Colo.
Mace, Don Lee, care Vaca Meat Co., Vacaville, Calif.
Mangus, Joseph David, Courtland, Kans.
Maugel, John Purdy, 525 Widener Ave., Philadelphia, Pa.
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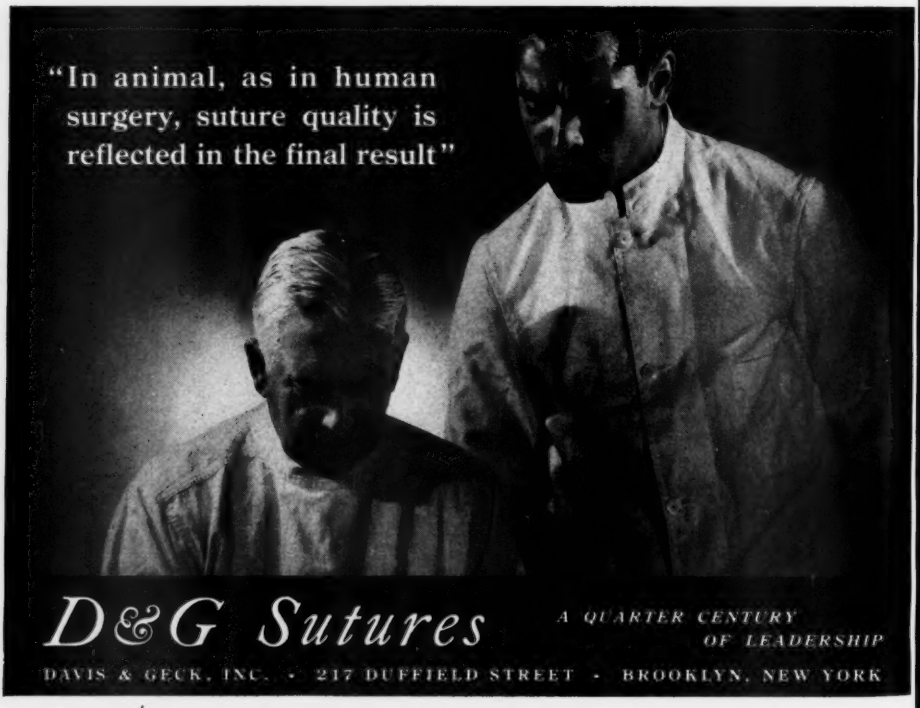
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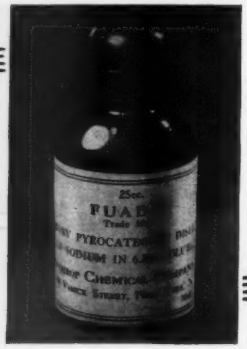

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Waddell, Wm. Fernando, 5704 S. 5th St., St. Joseph, Mo.

Waddell, Wm. Henry (Colored), 111 East 15th St., So. Richmond, Va.

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Watson, Clement Earl, 1130 Franklin Ave., Lexington, Mo.

Weisheit, Henry Carl, R.F.D. No. 1, Glenmont, N. Y.

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Wiggins, Thomas Taylor, R. R. No. 2, Box 273, Atmore, Ala.

Williamson, Wm. Welton, Barada, Nebr.

Wiseman, Edwin Stranel, Delphos, Kans.

Wiswell, Wilbur Harold, Gresham, Nebr.

Woods, Harry Milford, Box 606, Lake Wales, Fla.

Zickefoose, Frederic Samuel, Rossville, Kans.

Zimmerman, Irving, 315 West 79th St., New York, N. Y.

Mrs. H. E. Bemis, widow of the late Dr. H. E. Bemis, former dean of the School of Veterinary Medicine, University of Pennsylvania and for many years Professor of Surgery at the Division of Veterinary Medicine, Iowa State College, is reported dangerously ill at her home in Pennsylvania.

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Todd, F. Arnold, Hq. 1st C. A., Boston, temporary duty.

Trum, Bernard F., Hq. 1st C. A., Boston, temporary duty.

Second Corps Area

First Lieutenants:

Badger, George W., Buell, Herbert J., Higby, Willard C., Huber, Samuel F., Krukowski, Stanley M., Reese, William C., Seagers, William J., Tierney, William F., temporary duty at Fort Jay, N. Y., under instruction prior to being assigned to C. C. C. districts.

Third Corps Area

First Lieutenants:

Bartlett, Dansil C., Harrisonburg, Va.
Emas, Jack R., Lock Haven, Pa.
Goodman, Simon F., Baltimore, Md.
Richter, Jacob B., Pittsburgh, Pa.
Snyder, Arnold M., Harrisburg, Pa.
Wiseman, Edwin S., Richmond, Va.
Daman, Arthur H., unassigned.
Fischer, Oscar F., Jr., unassigned.

Fourth Corps Area

First Lieutenants:

Chastain, W. R., Fort Screven, Ga.
Odom, Houston, Fort Barrancas, Fla.
Willis, Robert L., Fort McClellan, Ala.

Fifth Corps Area

Broad, Fay E., Captain, Fort Benjamin Harrison, Ind.

Earhart, Robert N., 1st Lt., Fort Thomas, Ky.

Hinkle, Truman B., Major, Fort Knox, Ky.

Rock, Lee A., Captain, Fort Hayes, Ohio.

Scheetz, George F., 1st Lt., District Hq., C. C. C., Charleston, W. Va.

Sixth Corps Area

Hudson, Bentley F., Captain, Camp Custer, Mich.

Jones, Lloyd D., 1st Lieut., Fort Brady, Mich.

Law, Buell S., Captain, District Hq., C. C. C., Sparta, Wis.

Nichols, Japtha H., 1st Lt., Fort Sheridan, Ill.

Sheaff, Walter P., Captain, Jefferson Barracks, Mo.

Seventh Corps Area

Adan, Cirilo L., 1st Lt., Fort Meade, S. Dak.

Anderson, Horace L., Captain, Fort Des Moines, Iowa.

Donat, Lawrence C., 1st Lt., Fort Des Moines, Iowa.

Photograph approximately two-thirds size

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Here's a food veterinarians have wanted for years—a tasty appetite-stimulating food, crunchy, complete, ready to feed, low in cost—a food that the usual hospital case eats eagerly without adding fresh meat.

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MEATIES are the famous Miller's Ration in cube form—made of rich lean meat (equal to 45% fresh meat), wheat, rice, corn, barley, bone meal, salt, molasses, Dicalcium Phosphate, Fleischmann's Irradiated Dry Yeast and Leaf Alfalfa for Vitamins A, B, D, E, G. Biological feeding tests on laboratory animals and dogs prove that MEATIES are complete for normal growth, maintenance, and good health.

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Present indications are that various swine diseases may be quite prevalent within the next few weeks.

Enteric and Pulmonary disorders may occur in swine that have not been vaccinated with anti-hog cholera serum, in cholera immune swine, and as complications of cholera.

Best results from cholera vaccination are obtained only when healthy herds are treated. Swine sick of disease other than cholera should be properly treated prior to the use of serum and virus.

Kinsley's Mixed Bacterin Swine will be found par-excellent in controlling suipestifer enteritis, pulmonary oedema and hemorrhagic septicemia.

The method of procedure will depend upon the prevailing conditions. Swine affected with bacterial pulmonary or enteric disorders that are immune to cholera or unvaccinated should be given Mixed Bacterin Swine (Kinsley). Swine affected with cholera complicated with bacterial, pulmonary or enteric disorders should be given Mixed Bacterin Swine (Kinsley) in addition to the usual cholera immunization.

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VETERINARY

The veterinary history written by Drs. L. A. Merillat and D. M. Campbell will be ready for delivery about September 1, 1935.

Contains:

Short account of veterinary medicine from dawn of civilization to the present.

Development of the animal industry in the United States.

Veterinary medicine in America before the Civil War.

Veterinary medicine during the Civil War and post war period.

The founding and growth of veterinary colleges.

The development of veterinary practice during the nineteenth century.

The struggle for army veterinary legislation.

The enactment of veterinary practice laws.

The growth of a veterinary literature in the United States.

The long struggle for higher standards of veterinary education.

Many biographical sketches of veterinarians who have influenced the development of veterinary medicine in the United States and Canada.

The origin, growth and achievements of veterinary research.

A veterinary history of the Spanish-American War.

A history of the veterinary service in the United States during the World War.

A history of the veterinary service in France during the World War.

An account of the Veterinary Corps schools during the World War.

A record of veterinary laboratory service during the World War.

A record of veterinary food inspection during the World War.

A description of the present Veterinary Corps of the United States Army.

Halftone illustrations of prominent veterinarians since 1850.

Halftones of more than a thousand veterinary officers of the World War.

Illustrations of buildings and equipment of present and past veterinary colleges.

An account of veterinary associations and their achievements.

History of each of the present veterinary colleges, with buildings, deans, entrance requirements, course, graduates by years and prominent alumni.

History of organized veterinary medicine in the United States.

A large number of halftones showing places, individuals and groups of veterinary interest.

Special chapters by: Drs. C. J. Marshall, C. E. Cotton, F. H. Davis, J. P. Turner and W. H. Wright.

HISTORY . . .

INCLUDING REFERENCE MATTER AS FOLLOWS:

List of foreign veterinary colleges, with dates founded.
List of veterinary colleges in North America, with dates founded.
List of state veterinary associations, with dates founded.
List of officers and meetings of U. S. V. M. A., with dates.
List of officers and meetings of A. V. M. A., with dates.
List of army veterinarians prior to 1916, with service record.
List of veterinary officers (2313) during the World War, with service record.
List of Veterinary Hospitals of the World War and their C. O.'s.
List of Division Veterinarians during the World War and their assignments.
List of officers in present Veterinary Corps.
List of Veterinary Reserve officers.
Official Documents of the World War of veterinary interest.
List of veterinary books published in this country, 1793-1861.
List of veterinary books published in this country, 1861-1900.

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Carbozoo is recommended for immunization of cattle, horses, sheep, goats, and other animals against anthrax infection.

Carbozoo is not recommended for animals affected with anthrax. In such cases, anti-anthrax serum should be administered.

Dosage: ½ cc. for sheep, goats, and young calves under six months; ¼ cc. for horses and cattle. One dose is sufficient for definite protection.

Packages: 5 cc. vials (20 large or 40 small animals); 10 cc. vials (40 large or 80 small animals).

The older simultaneous and spore vaccines are available.

ANTI-ANTHRAX SERUM (Curative)

Dose: From 30 to 100 cc. Continue at 6-hour intervals until there is a drop in temperature.

Packages: 100 and 500 cc. vial, of equine or bovine origin.

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For the rapid agglutination test.

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Packages: 25, 50, 100 and 250 cc. vials.

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(Whole Culture)

Packages: 25, 50, 100 and 250 cc.

ANTI-BLACKLEG SERUM (Curative)

Dose: 30 to 100 cc. intravenously or subcutaneously.

Package: 100 cc. vial.

HEMORRHAGIC SEPTICEMIA AGGRESSIN

Dose: 5 cc. for horses and cattle, 2½ cc. for sheep, goats and swine, ½ cc. for fowl.

Packages: 25, 50, 100 and 250 cc. vials.

HEMORRHAGIC SEPTICEMIA VACCINE (Whole Culture)

A chemically killed undiluted whole culture.

Dosage: 5 cc. for cattle and horses; 3 to 5 cc. for swine and sheep; 1 cc. for fowl.

Packages: 50 and 250 cc. vials.

ANTI-HEMORRHAGIC SEPTICEMIA SERUM

For prophylaxis: Cattle and horses, dose 15 cc.; swine, sheep and goats, dose 10 cc.; fowl, dose 2½ cc.

For treatment: 50 to 100 cc. Repeat in 12 to 24 hours.

Packages: 100 and 500 cc. vials.

MASTITIS MIXED VACCINE
(Bovine) (Whole Culture)

For infectious Mastitis and Garget in cattle.

Dose: 5 cc. per animal.

Packages: 50 and 250 cc. vials.

MIXED BACTERIAL VACCINE
(Bovine) (Whole Culture)

For Infectious Metritis and retained placenta.

Treatment: 5 cc. per animal and repeat in 3 days.

Prophylaxis: 5 cc. for each animal on the premises. Repeat in 7 to 14 days.

Package: 50 cc. vial.

WHITE SCOURS VACCINE
(Whole Culture)

Dose: 5 cc. per animal.

Package: 50 cc. vial.

WHITE SCOURS ANTI-SERUM

For White Scours in calves and navel-ill in foals.

Dose: Prevention, 10 cc.; treatment, 30 cc. or more as required. Repeat as frequently as needed.

Packages: 10, 30 and 100 cc. vials.

• HORSES •

EQUINE INFLUENZA VACCINE
(Whole Culture)

A single 5 cc. dose gives a mild protection. Three doses give a more lasting protection.

Packages: 50 and 250 cc. vials.

EQUINE ANTI-INFLUENZA SERUM

For *prophylaxis* use 50 cc.; for *treatment* use 50 to 100 cc., and repeat in 12 to 24 hours if necessary.

Package: 50 cc. vial.

ANTI-EQUINE ENCEPHALOMYELITIS SERUM (Polyvalent)

Dosage: For *prophylaxis*—50 to 100 cc. For *treatment*—100 to 200 cc., preferably intravenously. Repeat in 8 to 12 hours.

Packages: 100 and 250 cc. vials.

MALLEIN (Subcutaneous)
(Intra-Palpebral) (Ophthalmic)

For the diagnosis of Glanders in horses.

MIXED BACTERIAL VACCINE
(Equine) (Whole Culture)

For mixed infections in horses.

Dose: 5 cc. per animal.

Package: 50 cc. vial.

TETANUS ANTITOXIN

For *immunization*, 1500 units. For *treatment*, from 10,000 to 100,000 units.

Packages: 1500 and 5000 units in syringes or vials; 10,000 and 20,000 units in vials.

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(With Alum Precipitate)

For lasting protection against tetanus.

Packages: 1 dose (10 cc.); 5 doses (50 cc.).

• HOGS •

ANTI-HOG CHOLERA SERUM (Clear)

When employed on susceptible hogs with the proper dosage of Hog Cholera Virus it establishes immunity.

Dosage: According to directions on package.

Packages: 100, 250 and 500 cc.

HOG CHOLERA VIRUS

Active virus to be used with serum in immunizing hogs.

Packages: 10, 20 and 50 cc. vials.

MIXED BACTERIAL VACCINE
(Swine) (Whole Culture)

For mixed infections in swine.

Dose: 5 cc. per animal.

Packages: 50 cc. and 250 cc. vial.

SWINE ERYSIPELAS SERUM

Effective in preventing losses from Swine Erysipelas.

Dose: 10 to 40 cc., according to weight.

Packages: 50, 100, 250 and 500 cc. vials.

• SMALL ANIMALS •

CANINE DISTEMPER VACCINE
Laidlaw-Dunkin Method

For immunizing dogs against Distemper. (One or two doses of 5 cc.).

When two doses of vaccine are employed, the interval between doses is from 10 to 15 days. To ensure life immunity virus should be given intradermally 14 to 21 days after the administration of vaccine.

Packages: 1—5 cc. syringe and 2—5 cc. syringes.

CANINE DISTEMPER VIRUS
Laidlaw-Dunkin Method

For completing the immunization against Canine Distemper. Use only after vaccine (from 14 to 21 days).

Package: 1 dose (10 mg. virus in syringe with diluent).

ANTI-CANINE DISTEMPER SERUM

Prepared by hyperimmunizing dogs with Canine Distemper Virus (Laidlaw-Dunkin), and organisms associated with the complications of distemper.

For Passive Immunity (10 to 20 days): Use 10–20 cc.

For treatment: 2 cc. per pound of body weight. Repeat in from 6–12 hours till symptoms are controlled.

Packages: 10, 30, 50 and 100 cc. vials.

ANTI-CANINE MIXED INFECTION SERUM

For the various mixed infections in dogs and the secondary infections following distemper.

Do not confuse with Anti-Canine Distemper Serum.

Package: 50 cc. vial.

CANINE RABIES VACCINE
(One Injection Method)

Immunizes for approximately one year. Repeat annually.

Both phenol- and chloroform-killed vaccine available.

Dose: 3 to 5 cc.

Good results are obtained in the treatment of exposed animals by the injection of 6—5 cc. doses of this vaccine at daily intervals.

Packages: 5 cc. vial, 6—5 cc. vials, 50 cc. vial (10 doses).

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(Dilution Method of Hogyes)

For the treatment of animals exposed to rabies. Six doses of this special, living, fixed virus in varying dilutions are given over a 6-day period.

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For treating staphylococcic infections such as Pustular Acne, secondary skin infections of mange and persistent abscesses and carbuncles.

Dosage should be graduated: Small animals—0.5 to 2 cc.; large animals — 1.0 to 5 cc.

Package: 10 cc vial.

FELINE MIXED VACCINE
(Killed Organisms)

For the prevention and treatment of distemper and infectious enteritis complications in cats.

Package: 5 cc. vial.

MIXED BACTERIAL VACCINE
(Canine)

For the treatment of mixed infections in dogs and the complications of distemper.

Dosage: 2 cc.

Package: 20 cc. vial.

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CANINE DISTEMPER COMPOUND

"Dejem" is decidedly beneficial to dogs with DISTEMPER. It also controls the severe sickness following inoculations.

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Harlan, William H., 2nd Lt., Oklahoma City, Okla.
McGrath, James C., Captain, Fort Logan, Colo.
Reid, Joseph J., Captain, San Antonio, Texas.
Shipley, Michael, Captain, San Antonio, Texas.
Thompson, William M., 2nd Lt., Fort Logan, Colo.
Wirtz, John H., Captain, unassigned.

Ninth Corps Area

Adams, John D., Captain, Boise District.
Asbill, Stephen G., 2nd Lt., Redding District.
Bentham, Wilfred S., 2nd Lt., Medford District.
Bolenbaker, R. F., Captain, Fresno District.
Boender, Fred J., 1st Lt., Fort Lewis District.
Hoon, Henry R., 1st Lt., Lewiston District.
Kermen, William R., 2nd Lt., Fort MacArthur District.
Orr, Norman A., 2nd Lt., Fort Douglas District.
Paxton, John D., Captain, Sacramento District.
Rogers, Arthur B., 2nd Lt., Pocatello District.
Saunders, Charles M., 2nd Lt., Seattle Q. M. Depot.
Wilson, Willis, Captain, Fort George Wright District.

COLORADO VETERINARIANS HOLD THEIR BEST MEETING

The semi-annual meeting of the Colorado Veterinary Medical Association was held May 23 and 24 at the veterinary hospital, Colorado State College, Fort Collins, with approximately 50 veterinarians in attendance, a good attendance considering the bad weather and the busy season.

The opening session was called to order by President E. N. Stout of Fort Collins. The literary program consisted of the following papers:

"Equine Gastro-Enteritis" by N. J. Miller, Eaton. This paper was devoted principally to the condition known as "acute dilatation of the stomach" and to "impaction balls" so frequently encountered in the districts where alfalfa is fed. The symptoms and treatment led to a lively discussion.

"Suturing Materials and Suturing," Dr. H. E. Kingman, Cheyenne, Wyoming. This was a demonstration and discussion of materials and methods used by Dr. Kingman in treating prolapses of the genitalia. The subject was presented in a very practical manner.

"Feline Infectious Enteritis," by C. E. Salsbery, Kansas City. Dr. Salsbery and his staff have conducted an extensive research upon this subject which has added greatly to the meager knowledge available to the profession. This paper was especially interesting to the practitioners interested in feline practice.

TREAT *the* **DISEASE** *at the* **SOURCE AND THE SYMPTOMS WILL CEASE**

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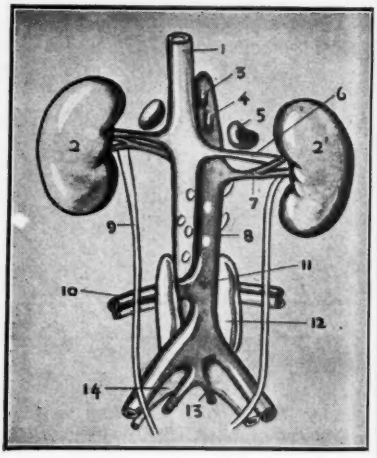

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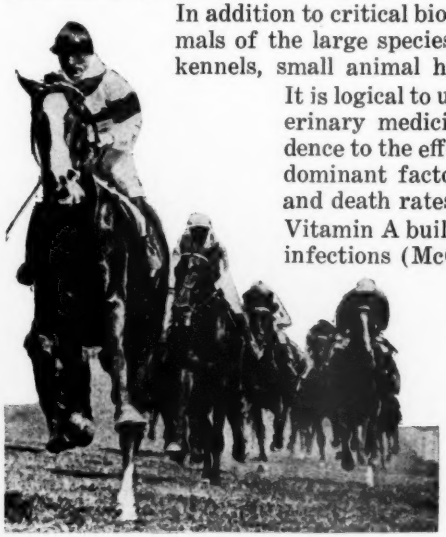
Vitol is a treatment for avitaminosis and mineral insufficiency in all domestic animals

Like the principal underlying vitamin-mineral therapeusis, Vitol has long since passed the stage of experimentation. Experimental demonstrations and clinical tests preceded its introduction to the veterinary profession by more than four years.



In addition to critical bio-assays in dogs and young animals of the large species, the findings were proved in kennels, small animal hospitals, stables and ranches.

It is logical to use Vitol on a large scale in veterinary medicine as there is abundant evidence to the effect that vitamin deficiency is a dominant factor in the incidence of disease and death rates.

Vitamin A builds up resistance to respiratory infections (McCollum, 1917, Bloch, 1931, Ellison, 1932); vitamin B, to digestive and nervous disorders; vitamin C to streptococcic infections (Findlay, 1923, Moody and Jackson, 1927); and so one may continue through all the references on each ingredient of Vitol.

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5-lb. cans, less than six	$ 2.20
6 5-lb. cans	12.00
12 25-oz. cans	10.80
24 12-oz. cans	12.00
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"I am having very marked success in the treatment of various conditions with your liquid blister and like it very much, fact is I simply cannot be without it." R. C. Finkle.

An address of welcome by President Lory, of Colorado State College, was enjoyed. One of Doctor Lory's outstanding characteristics is to make you "feel at home" and that you are a part of your organization which is second to none.

The afternoon was devoted to clinic. Geo. H. Carr, Brighton, was chairman of the large animal section and C. C. Stewart, Colorado Springs, of the small animal section. Demonstrations included:

Removal of opaque crystalline lens and tonsilectomy, by A. A. Herman, Denver. The doctor has devoted his entire time for several years to the small animal practice and has developed a very skillful surgical technic.

Out-of-state talent for the surgical program was Geo. R. Fowler, Iowa State College. He discussed very concisely the field of operation, the advantages and disadvantages of certain methods as found from his own experiences. The opportunity to witness Doctor Fowler's work was a revelation. Operations performed by Doctor Fowler during the afternoon were: Resection of the plantar aponeurosis, to establish drainage; removal of the lateral cartilage and trephining.

Considerable discussion relative to the after-care of the cases followed.

The banquet and dance was held in Ammon's Hall on the campus the evening of the first day with R. F. Bourne, Fort Collins, toast-

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Statement made by New York State Veterinarian

The above statement is but one of many hundreds we have in our files from Veterinarians all over the country endorsing Fistone as the supreme anti-suppurant. In such cases as Fistulous Withers, Catatthal Metritis and Chronic Suppurative affections due to Internal Focal Infections, nothing has proven so successful as Fistone.

Fistone is fed in bran or oats morning and evening, by the teaspoonful. Mail the coupon now for a trial order.

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Enclosed please find check for $8.00, for which send me one dozen 12 ounce boxes of FISTONE (Trial Order)—once only. Regular Price:

One dozen boxes.....$10.00
One-half dozen boxes..... 5.00
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Have you tried this reconstructive? It is effective and economical!

Write today for new booklet "Can You Keep Your Small Animals Out of the Rough?"

Tonamine builds up the strength of undernourished puppies and convalescent animals. Restores the appetite of run-down small animals. Successfully offers Vitamin B, G and D as a supplement to regular diet. Also rich in food value and good for distemper. Tonamine is the ideal reconstructive.

R. J. STRASENBURGH CO.
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HIDROGEN

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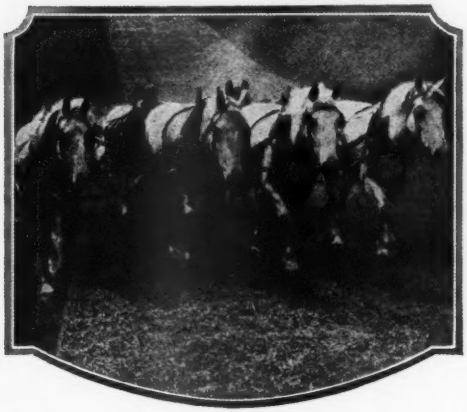
PANTING—OVER-HEATED—NON-SWEATING

HORSES



In treating heat exhaustion in horses, down or about to collapse, dosing with Hidrogen every half hour or so until the crisis has passed is the best internal treatment we know.

The use of Hidrogen is founded upon experience obtained when hundreds of horses "dropped from the heat" on city streets.

It Will Not Disappoint

Pint.....$1.50 Gallon.....$9.00

If you procure a pint for a coming emergency, you will buy a gallon before the hot weather is over.

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master, was attended by 180 which represents one of the largest attendances ever recorded by the association. The after-dinner speakers included Doctors Salsbery, Geo. R. Fowler, Lory, E. Sandsten, Geo. H. Glover and Mr. Tom Warren. The final talk was by I. E. Newsom, dean of the veterinary division. He discussed the status of veterinary education, stressing especially the future outlook.

The second day Doctor Salsbery of Kansas City, Missouri, gave an exceptionally good paper on "Bovine Mastitis," emphasizing the factors pertaining to etiology, tests that are applicable for the practitioner to use in the field and the final disposition of the case as determined by both physical and simple laboratory examinations. J. H. Bouton of Aurora and G. G. Miller of Denver, demonstrated methods of restraining small animals and the use of anesthetic reagents that insure the most desirable results. Geo. H. Carr of Brighton performed an equine cryptorchid operation, an excellent demonstration. Surgery of the food of the ox was presented by Dr. Geo. R. Fowler, duplicating the high class technic as exhibited the preceding day upon the equine subject. Enucleation of the eye (cow), by M. E. Spratlin, Littleton.

Peroneal tenotomy and median neurotomy, by Jas. Farquharson, Colorado State College, an excellent demonstration of intravenous injections in the dog by C. C. Stewart, Colorado Springs, and Reduction and Handling of Fractures in the Dog, by A. N. Carroll, Pueblo, by the Dibbell method concluded the clinic in which more interest was manifested than in any clinic the association has held for some time.

EASTERN IOWA VETERINARY ASSOCIATION

The 22nd annual meeting of the Eastern Iowa Veterinary Association will be held at the Hotel Montrose, Cedar Rapids, October 15 and 16, 1935.

Revised regulations for the importation of domestic live stock and other animals were announced by the United States Department of Agriculture, effective August 1, 1935. The new regulation is identified as B. A. I. Order 352. The principal changes incorporated in the new order are: The exemption of cattle from modified accredited areas in Canada from testing for tuberculosis as an import requirement; the exemption of Mexico from the provisions of the order in view of a separate treaty which the United States now has with Mexico regarding various livestock subjects, and general simplification of the regulations.

A pig that has been immunized against hog cholera can take in one injection as much as 500 million times the fatal dose of hog cholera virus and show no signs of the disease. Anti-hog cholera serum is produced under B. A. I. supervision in approximately 50 establishments.—J. R. Mohler.

PUNCTURE wounds, or the impaction of foreign matter between the claws will often set up an inflammatory condition of the digits and interdigital spaces of hoofed animals.

The inflammation tends quickly to subside if poultices of Antiphlogistine are applied to the inflamed region. The dressing should be left **in situ** for 24 hours, after which time a fresh one may be applied.

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